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DRL No. 23  
DRD No. SE-Q79TA  
JSC No. 11008

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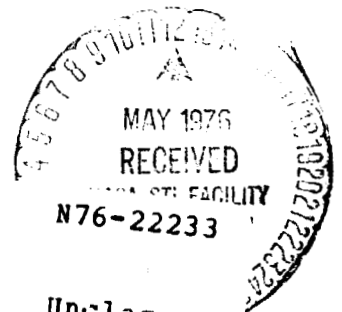
147600

SMS  
Engineering Design Report

NASA Contract NAS-9-14910  
Type 2 Data

Date: 2 April 1976

(NASA-CR-147600) SMS ENGINEERING DESIGN  
REPORT (Singer Co., Binghamton, N.Y.) 331 F  
HC \$10.00 CSCI 14B



G3/14 Unclass  
25345

Singer  
Simulation Products  
Division  
Binghamton, New York

## FOREWORD

The Engineering Design Reports are prepared in sections, with each section representing a subsystem development activity. The information contained in this document is required at PDR and at CDR. Because PDR's and CDR's are scheduled on an incremental basis, the Engineering Design Report sections are prepared incrementally consistent with the scheduled dates for associated subsystem PDR's and CDR's.

The initial release of the Engineering Design Reports will contain sections required for the first PDR's held. Sections required for subsequent PDR's will be released as changes to the initial release. Revision A of the Engineering Design Reports will initially contain sections required for the first CDR's held. Sections required for subsequent CDR's will be released as changes to Revision A.

Engineering Design Report  
DRL Item 23, DRD SE-079TA

1.0 General

The Engineering Design Reports for the Shuttle Mission Simulator (SMS) are contained in separate sections of this document. These sections are generated individually for use during the design reviews held for the applicable systems of the SMS.

The sections of the SMS Engineering Design Report are listed below:

- Section 1 - Electrical Power System (EPS)
- Section 2 - Mechanical Power System (MPS)
- Section 3 - Main Prop and Ext. Tank
- Section 4 - Solid Rocket Booster
- Section 5 - Reaction Control System
- Section 6 - Orbital Maneuvering System
- Section 7 - Guidance, Navigation & Control
- Section 8 - Comm and Tracking Insts.
- Section 9 - Env. Cont. & Life Support
- Section 10 - Data Processing System
- Section 11 - Mechanical System
- Section 12 - Payload Accommodation (Not Required)
- Section 13 - Vehicle Dynamic System
- Section 14 - Mission Control Center Interface
- Section 15 - Image Generation System
- Section 16 - Image Display System

Section 17 - Image Processing & Control  
Section 18 - Software Stds & Support Software  
Section 19 - Utility Software  
Section 20 - Crew Stations  
Section 21 - Motion Base (Not Required)  
Section 22 - Instructor Operator Stns  
Section 23 - Digital Computer Complex  
Section 24 - Signal Conv. & Ancillary

DRL No. 23  
DRD No. SE-079TA  
JSC No. 11008

## Engineering Design Report

### Release Control Sheet

First Release - 2 April 1976

This release of the EDR comprises the following  
section(s):

<u>Section</u>	<u>Description</u>
20	Crew Station
22	Instructor/Operator Station
24	Signal Conversion & Ancillary (Partial)

"SMS-EDR"

IDENTIFYING  
INCREMENTAL SECTION  
RELEASE SHEET

The following is part of Section 20, WP #20  
Subsection - Controls and Displays.

# ENGINEERING DESIGN REPORT CONTROLS AND DISPLAYS

## 1.0 SCOPE

This report describes the intended design approach to all electrical hardware on the pertinent C&D panels in the fixed base and moving base crew stations of the SMS. Subsequent paragraphs will outline the approach to be taken with regard to each different type of component.

## 2.0 GENERAL DESIGN CONSIDERATIONS

The main overall hardware design approach is to make all astronaut cues and responses a function of digital inputs and outputs from the digital computer and AST Linkage. The same intention is generally true of analog cues and responses as well. This is of course not possible in the case of all the controls and indicators on the crew panels. Lighting switches and variable controls will need to be "hardwired" to the lights which will be placed in the simulator crew station.

Other areas which require unique designs are: the COAS, Caution & Warning, the Rotational and Translational Hand Controllers, the Speed Brake Thrust Controller, the Navigation and Flight Instruments, the Communications System, the MCDS, the X-Pointer and the readouts.

The MBCS shell, secondary structure (except overhead), seats installation, rudder pedal controls installation and air condition system will be the same as OAS except that the A/C outlet will be variable controlled. The FBCS forward shell, from station 516 forward, will be constructed the same as the

OAS. All primary structure with the exception of the overhead blow out structure will be the same as OAS. The seat and rudder pedal installation for the forward crew station will be the same as OAS. The FBCS air conditioning will be controlled via a conventional thermostat and not via any crew station controls. All visible A/C outlets will be mounted as per OV 102 data. The Aft Crew Station shell and secondary structure will be described at a later date.

## 2.1 INDICATORS AND METERS

The indicators and meters on the C&D panels will be as in the actual spacecraft or be simulated versions of Orbiter 102 indicators. Drive shall be supplied by computer analog outputs deriving their values from programmed equations. The power to the indicators will be controlled by an LO or its effect will be reflected in the AO equation.

All indicators and meters will be lighted as per mil L-27160 except the GFE ADI and Cross-Pointer Indicator which will be lighted as required.

## 2.2 EVENT INDICATORS, WARNING LIGHTS AND ANNUNCIATORS

All event indicators, warning lights and annunciators will be controlled from the computer by LO's. Any light that receives power from a variable lighting bus in the spacecraft will be connected to a variable lighting bus in the simulator.

The test function of all Warning and Annunciator lights will be operated directly by their appropriate test switches.

## 2.3 SWITCHES

2.3.1 Each switch that controls a simulated function of the SMS will be wired to a DI. The common contact will be wired to ground.

2.3.1.1 Each 3-position toggle switch will be wired to two (2) DI's. The center position will not be wired.

2.3.1.2 Each 2-position toggle switch will be wired to one (1) DI. In the case of a momentary switch the DI will always be on the normally open contact.

2.3.1.3 Each rotary switch will have ground supplied to the rotor and a DI on each position.

2.3.1.4 The lighted push-button switches will have a DI to indicate the selected function, and an LO to light it. Two LO's will be assigned where split legends require it.

2.3.1.5 The digi-switches will have DI's associated with each binary-coded output. The common terminal will be connected to ground.

## 2.4 CIRCUIT BREAKERS

2.4.1 The popping function of all circuit breakers will be computer controlled through LO's.

2.4.2 The switching function of all circuit breakers that control a simulated function of the OAS will be wired to a DI.

## 2.5 POTENTIOMETERS

Rheostats and potentiometers will be excited by  $\pm 10$  VDC. Each wiper will be connected to an AI. Exceptions to this will be light dimming controls which will be hardwired in their system and not input to the computer.

### 3.0 UNIQUE PROBLEMS

The following paragraphs explain further the design approach to the unique problems mentioned briefly in para. 2.0.

#### 3.1 MCDS

The Multifunction CRT Display System consists of Display Units, Keyboard Units, and Display Electronics Units which are GFE. The Keyboard Unit has 32 push-button function and number keys which shall be used to call for or enter information which shall be displayed on the pertinent CRT's. This will be accomplished by dedicating 32 DI's, one DI per key. Inputs to the DEU will be by way of DO's which can be enabled from the on-board keyboards or from the instructor's keyboard when the IS ACTIVE mode is enabled. The Display Units shall be wired direct to the DEU's.

#### 3.2 CAUTION AND WARNING SYSTEM

Caution and Warning System lights are located in several areas of the SMS. Master Alarm switch-lights are on the forward and aft panels, the 48-light C&W Annunciator is on F7 and the 120-light C&W status display is on R13. All of these lights will be driven from digital outputs. The on-board C&W logic will be simulated as a software function.

The Caution and Warning System also includes a number of audible warnings. These will be generated using standard Link sound system hardware such as voltage controlled frequency generators and voltage controlled attenuators. Discrete computer outputs will turn these on and the audio will be fed through the audio system.

### 3.3 SIMULATED LIGHTING SYSTEM

The design philosophy employed in driving crew station lighting is outlined below.

3.3.1 The lighting system, in principle, will be an analog model of the spacecraft system. Digital outputs from the computer will turn on relays to simulate each of the various lighting buses. In each case the power from these simulated buses will be wired through the contacts of the appropriate simulated circuit, then through switches and dimming controls as required based on approved spacecraft data. The power will then go to the lights.

Lighting intensity controls will in all cases dim those lights which the same control dims in the spacecraft if that light is in the simulated area of the OAS.

### 3.4 ROTATIONAL AND TRANSLATIONAL HAND CONTROLLERS

The rotational and translational hand controllers are furnished to Singer as GFE. The RHC requires 1500 Hz AC voltage excitation and outputs three continuously variable voltages as a function of handle deflection on three axes. These three signals will be conditioned and fed into the digital computer as AI signals for use in the flight dynamics system. Control switches on the hand controller will be connected to DI's. It is expected that no modification will be made to the GFE controller.

The THC is assumed (no definitive information at time of writing) to be operational in the same way as the RHC and therefore will be interfaced with the computer linkage and programs similarly.

### 3.5 COMMUNICATIONS SYSTEM

The communications system of the OV-102 vehicle will be simulated and described more fully in the Audio Systems EDR and CEI. The communications controls located on panels 05, L5, 09, R6, R10, A11, A2, L9 and A5 will interface with the Audio Systems either directly or through the computer. The Audio Systems will contain the simulated crew paging and intercom, A/A and A/G circuits, as well as tracking and warning tones. Selection and volume controls will be taken to the computer as necessary.

### 3.6 SBTC

The Speed Brake Thrust Controller in the SMS will be a replica of the actual controller. The position output will be relayed to the pertinent flight programs in the computer through an AI. The manual takeover switch will be wired to a DI.

### 3.7 INSTRUMENTS

The navigation and flight instruments will be installed and functionally operational in the SMS. Proper simulated power, drive and tie-in to other systems will be provided thru a combination of software and hardware. Control signals for synchro/resolver driven simulator instruments will be accomplished electronically, through the use of an Electronic Synchro/Resolver Driver (ESRD) system. Either resolvers or synchros may be operated by computing the correct output functions:

V Sin $\theta$	)	
V Sin ( $\theta + 90^\circ$ )	)	for resolvers
V Sin $\theta$	)	
V Sin ( $\theta + 60^\circ$ )	)	for synchros

When these functions are applied to the SRD modulators, the proper AC control signal will be obtained to drive the resolvers or synchro.

Some instruments will require drive signals consisting of serial digital data. These signals will be generated by utilizing electronic circuitry to convert the parallel data as output from the computer to serial data as required by the instrument.

Other instruments will be driven directly by DC analog outputs from the computer linkage system.

### 3.8 COAS

The crew optical alignment sight power will be provided as required.

### 3.9 X-POINTER

The cross pointer indicator is provided as GFE. Computer programs through AO's shall drive the two pointers and external circuitry shall be provided to limit voltage excursions as required by the instrument.

### 3.10 READOUTS

The Event and Mission Timers, the propellant quantity indicators, and the Range/Pitch Angle and Range Rate/Roll Angle readouts shall be replicas of the spacecraft equipment or be simulated versions driven by computer programmed LO's.

DETAILED PANEL DESIGN

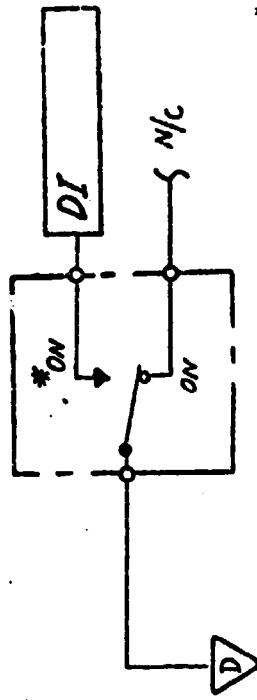
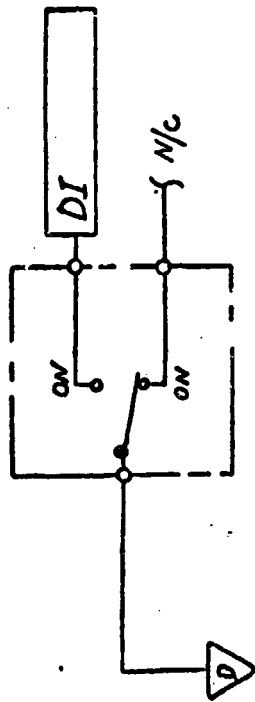
VL70-730102 Revision 1 dated 12/12/75, and panel changes received on DTD.6 February 1976, all of which show the crew station panels with the exception of panels A7 and A8, and the payload station and RMS panels, were used in the design of the crew station controls and displays. The Appendix is a component listing generated from the above panel drawing.

**Appendix A**

**SMS**

**Component Listing**

TYPE 1 & 1A



TYPE 2 & 2A

TYPE	DESCRIPTION	SPD PART NUMBER	REF PART NUMBER
1	ON - ON	1003370-02	ME452-0102 - 6101 - 6201 - 6301 - 6401
1A	*ON - *ON	1003604-01	ME452-0102 - 6151 - 6251 - 6352
2	*ON - ON	1003370-05	ME452-0102 - 6102 - 6202 - 6302
2A	*ON - *ON	905829 (GFE)	ME452-0102 - 6256

NOTE:-

1. [ENJ] DENOTES NEUTRAL CENTER SWITCH POSITION

2. # DENOTES LIFT-LOCK

3. \* DENOTES MOMENTARY

REV A 1 SPD PIN FOR TYPE 1 & 2 ADDED.

2. D' GROUND SPECIFIED.

REV B 1. TYPE 1A & 2A SPD ADD.

REF.	DWG. NO.	REV.	PAGE	DATE	REV.	APPR.	REV.	DATE	TITLE
VL70-730101	D	A	12/9/74	6/6/75	8/2/75	8/2/75	8/2/75	4-4-75	TOGGLE SWITCHES
		B		8/2/75	8/2/75	8/2/75	8/2/75		TYPICAL
		C							202-101-1

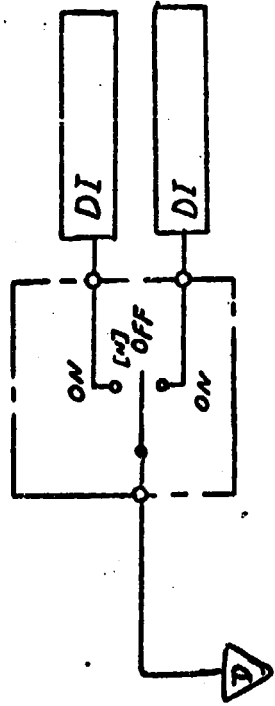
PANEL TYPICAL

SYNTHETIC 0A5

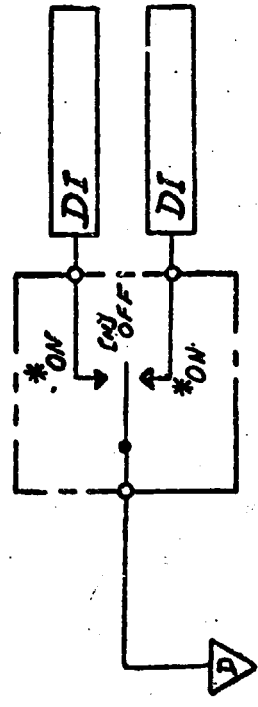
PAGE 1 OF 5

SKETCH

TYPE 3A



TYPE 4

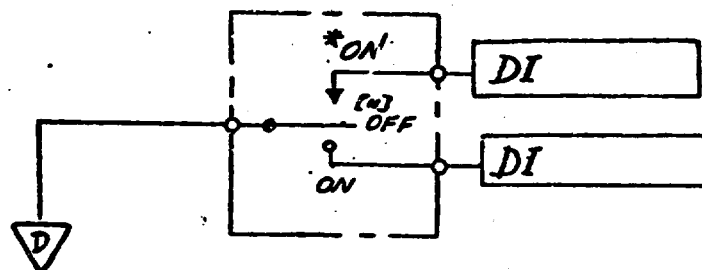


TYPE	DESCRIPTION	SPD PART NUMBER	REF PART NUMBER
3	ON - OFF - ON	1003370-01	ME452-0102 - 6103 & ME451-0102-6106 - 6203 & 6206 - 6303 & 6306
3A	#ON - OFF - #ON	1003604-02	ME452-0102 - 6353 6354
4	*ON - OFF - *ON	1003370-04	ME452-0102 - 6105 - 6205 - 6305 - 6110 - 6210

REV A 1. D GROUND SPECIFIED.  
2. SPD PN TYPE 3 & 4 ADDED  
3. TYPE 3 REF P/Ns ADDED  
REV B TYPE 3A SPN ADD

REF. VL 70-730101	DWG. NO. D	REV. 12/9/74	PAGE 5	TITLE TOGGLE SWITCHES
REL. DATE 4-4-75				TYPICAL
ENG. [Signature]				202-101-2
APPR. [Signature]				

# TYPE 7 & 7A

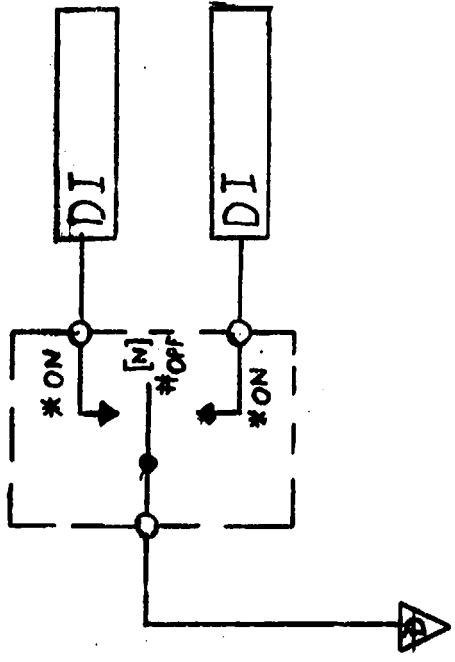


TYPE:	DESCRIPTION	SPD PART NUMBER	REF PART NUMBER
7	ON - OFF - *ON	1003370-03	ME 452 - 0102 - 6108 - 6208 - 6107
7A	*ON - *OFF - ON	1003604-03	ME 452 - 0102 - 6258

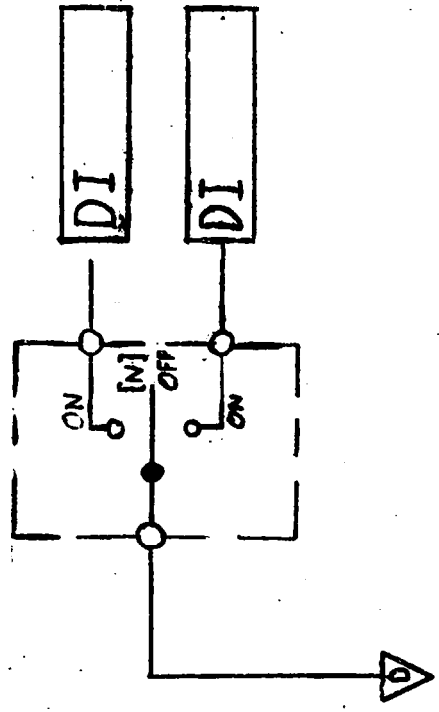
- REV A
1. REF P/N ADDED TO TYPE 7
  2. D GROUND SPECIFIED.
  3. SPD P/N ADDED TO TYPE 7
  4. \* MOVED FROM 9 TO 5 SW. POS
  5. # DELETED FROM ON IN TYPE 7A
- REV B
- TYPE 7A SPD ADD.

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	REV.	APPR.	REL. DATE	TITLE
VL70-730101		D		A	6/6/75			4-4-75	TOGGLE SWITCHES
		12/9/74		B	8/15/75				TYPICAL
				C					202-101-5

TYPE 9



TYPE 11 & 12

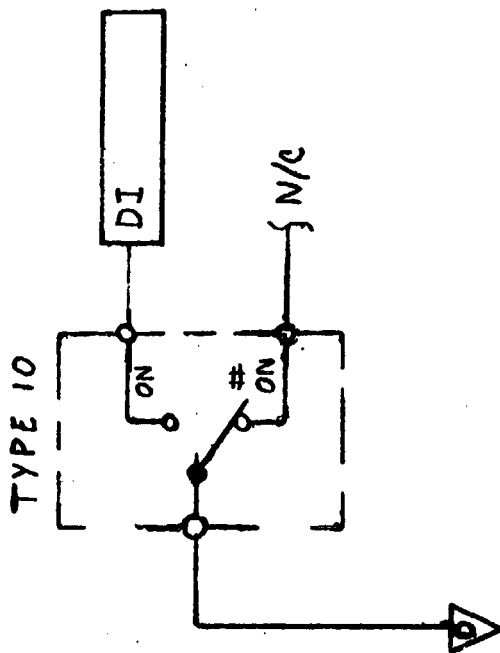


TYPE	DESCRIPTION	SPD PART NO.	REF. PART NO.
9	ON* - OFF# - ON*		ME452-0102
11	ON# - OFF - ON		ME452-0102
12	ON - OFF# - ON		ME452-0102 - 6354

NOTE:

1. [N] - DENOTES NEUTRAL CENTER SWITCH POSITION
2. # DENOTES LOCKED POSITION
3. \* DENOTES MOMENTARY POSITION

REF. Dwg. NO. VL70-730102	REV. PAGE	REV. DATE	REV. APPR.	REL. DATE 3/31/76 ENG. IF <i>[Signature]</i> APPR. _____	TITLE TOGGLE SWITCHES TYPICAL
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TYPE	DESCRIPTION	SPD PART NO.	REF PART NO.
10	ON-ON <sup>#</sup>		MC 452-0102

NOTE:  
A. # DENOTES LOCKED POS.

REF. DWS. NO. VL70-730102	REV. PAGE	REV. DATE	REV. APPR.	REL. DATE 3/31/76	ENG. TF O'Neil	APPR.	TITLE TOGGLE SWITCHES TYPICAL
PANEL TYPICAL				SIMULATOR SAMS		PAGE 2	OR 2

SWITCH SETTINGS							
SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	PROC PART NO.	SPD NO.	SEE SKETCH	NO D.I. AT SW POS	DESC
COMM B ANT DEPLOY/STOW	3	DEPLOY STOW	6103 ⊕	1003370-01	TDRS SW TYP	GRD	ON-OFF-ON
JETTISON ARM	1A	ARM # SAFE #	6151 ⊕	1003604-01			ON# ON#
JETT	1	JETT —	6101 •	1003370-01			ON-OFF
COMM B POWER	3	ON OFF	6103 ⊕	1003370-01		STBY	ON-OFF-ON
ANT STEERING TDRS	4	EAST * WEST *	6105 ⊕	1003370-04		—	ON*-OFF-ON*
SEARCH	2	SEARCH* —	6102 *	1003370-05			ON*-ON

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# DENOTES LIFT LOCK  
\* DENOTES MOMENTARY.

ME 452-0102.-

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		0	4	A				3/31/76	ON ORBIT CONTROLS
36V73A1A1				B				TE. [Signature]	A1A1
				C				APPR. _____	

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION- PROC. PART NO.	SPD PART NO.	COMMENTS- TYPE	DESC.
<u>EVENT IND</u>	<u>COMM B ANT</u>	<u>ME 452-0222</u>		<u>2 STATE 2C</u>	<u>GRAY-B.P.</u>
	<u>COMM B STATUS</u>				
	<u>TRACK</u>				
	<u>TDFS</u>				
	<u>SEARCH</u>				
	<u>ANTENNA STATUS</u>			<u>3 STATE 3J</u>	<u>W-B.P.-E</u>
<u>R. SW</u>		<u>ME 452-0093H-5022</u>	<u>1003512-01</u>	<u>2 STATE 2C</u>	<u>GRAY-B.P.</u>
				<u>4 POS ROT.</u>	<u>SW</u>

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OF 1001 QUALITY

REF. DWG. NO. <u>VL70-730102</u> <u>36V 73A1A1</u>	REV. <u>0</u>	PAGE <u>4</u>	REV. <u>A</u>	DATE	ENG.	APPR.	REL. DATE <u>3/31/26</u>	PNL <u>NAI</u>	TITLE
			B				ENG. <u>TF Mubert</u>		
			C				APPR.		

## STINGS SWITCH

## STINGS SWITCH

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	PRQ CHANNEL PART NO	CORE LOG SPD NO	SEE SKETCH	CENTER SW. POS.	COMMENTS
LINE OF SIGHT RATES	1	XI XIO	-6101	1003370-02			ON-ON
SLEW	1	FAST SLOW					
PITCH	4	UP* DN*	-6105	1003370-01			ON*-OFF-ON*
ROLL	4	L* R*					
SIGNAL STRENGTH S BAND FM	3	S BAND FM S BAND PL	-6103	1003370-01		KU	ON-OFF-ON
RANGE/PITCH ANGLE RANGE RATE/ROLL ANGLE	3	RR MILES ANGLES				RR XFT	
CONTROL COMMAND	1	CONTROL COMMAND PANEL	-6101	1003370-02			
RNDZ RDR/COMM A POWER MODE	3	ON OFF	-6103	1003370-01		STBY	ON-OFF-ON
RDR LOOP	1 ?	RDR LOOP COMM	-6101	1003370-02		RDR PMS	ON-ON
HIGH	3	HIGH LOW	-6103	1003370-01		MED	ON-OFF-ON
COMM DATA MODES	1	KU A KU B	-6101	1003370-02			ON-ON

\* DENOTES ANDOM POS.

ME 452-Q102-

REF. DWG. NO. VL70-730102 36V73A1A2	REV. PAGE 0 4	REV. DATE A B C	ENG. DATE APPR.	REL. DATE 3/31/76 ENG. <i>TF</i> APPR.	TITLE PML A1A2
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ME 452-0102

TITLE  
PNL AIA2

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION PROC PART NO.	SPD NO.	COMMENTS--	DESC.
X POINTER	LINE OF SIGHT RATES		GFE similar to 582882	X	POINTER GFE
VE METER	SIGNAL STRENGTH				
DIG. METER	RANGE/PITCH ANGLE				4 DIGIT METER
DIG. METER	RANGE RATE/ROLL ANGLE				5 DIGIT METER
ROT. SW.	LINE OF SIGHT RATES DISPLAY/SLEW	ME 452-0093 --		2 POS. ROT. SW.	
	<del>COMMA</del> DATA MODES LOW DATA RATE	ME 452-0093 - 5022		5	
	HIGH DATA RATE	ME 452-0093 - 5028	1003512-02	6	
	ANTENNA STEERING	ME 452-0093 - 5024	1003512-01	4	

REF. DWG. NO. VL70-730102 36V73A1A2	REV. PAGE D 4	REV. DATE A B C	ENG. APPR.	REF. DATE 3/31/76 ENG. <i>TF O'Brien</i> APPR.	TITLE PWL A1A2
PANEL A1A2			SIMULATOR SMS		PAGE 3 OF 4

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REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102 36V73A1A2		0	4	A				3/31/76	PNL A1A2
				B				ENG. <i>TF</i>	
				C				APPR.	

PANEL A1A2

SIMULATOR SMS

PAGE 4 OF 4

ME-452-0102-

PANEL A1A3 SIMULATOR SMS PAGE 1 OF 2

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PROC. PART. NO.	CORE LOC. SPD NO.	SEE SKETCH	NO DI AT SW POS.	COMMENTS-DESC
ATTACHED PAYLOAD TONE	3	ON	-6103 <sup>⊗</sup>	1003370-01	T66LE SW TYP	—	ON-OFF-ON
		OFF					
A/C 1	3	ON				—	
		OFF					
↓ 2	3	ON				—	
		OFF					
A/A	3	ON				—	
		OFF					
ICOM 1	3	ON				—	
		OFF					
↓ 2	3	ON				—	
		OFF					
↓ PAGE	3	ON				—	
		OFF					
S29 PL BAY OUTLETS ICOM 1	1	ON	-6101 <sup>⊗</sup>	1003370-02			ON-ON
		OFF	—	—			↓
S30 ↓ 2	1	ON	↓	↓			
		OFF	—	—			

⊗ ME 452-0102-

REF. VL70-730102 36V73A1A3	DWG. NO.	REV. 0	PAGE 4	REV. A	DATE	ENG.	APPR.	REL. DATE 9/31/76	TITLE PNL 41A4
				B				ENG. IF <i>Hebert</i>	
				C				APPR.	

## SWITCH STINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN- CLATURE	PRC. CHANNEL PART NO.	CORE LOG SPD NO.	SEE SKETCH	NO. OF AT SW. POS.	COMMENTS DESC.
S7 DOCKING DOCKING MECH. GUIDE RING	1	EXTEND	-6101 <sup>⊕</sup>	1003370-02	TOGGLE SW. TYP		ON-ON
		RETRACT	—	—			
S8 CAPTURE	2	RELEASE*	-6102 <sup>⊕</sup>	1003370-05			ON*-ON
		CAP LATCH	—	—			
S9 STRUC RING LATCH	3	CLOSE	-6103 <sup>⊕</sup>	1003370-01		OFF	ON-OFF-ON
		OPEN					
S10 EMERG	3	UNDOCK				OFF	
		RECYCLE					
S25 DOCKING MOD EXTEND. TUNNEL	3	EXTEND				OFF	
		RETRACT					
S26 LATCH	3	CLOSE				OFF	
		OPEN					
JETTISON ARM	1A	ARM #	6151 <sup>⊕</sup>	100360401			ON#-ON#
		SAFE #	—	—			
S28 JETT	1	JETT	-6101 <sup>⊕</sup>	1003370-02			ON-ON
		—	—	—			
S33 POWER	1	ON					
		OFF	—	—			

\* DENOTES NOM SW. POS

⊕ ME 452-0102-

# DENOTES LIFT-LOCK SW POS

REF. DNG. NO. REV. PAGE	REV. DATE ENG. APPR.	REL. DATE	TITLE
VL70-730102 36V73A1A4	A _____ B _____ C _____	3/31/76 ENG. JF Herbert APPR. _____	PNL A1A4

[illegible][illegible]

## SWITCHINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PROC. PART NO	CORE LOG. NO.	SEE SKETCH	NO DI. AT SW. POS.	COMMENTS-DESC.
S1 <u>PAYLOAD BAY DOOR</u> MODE	3	AUTO MAN	-6103*	1003370-01	16LE SW TYP	STOP	ON-OFF-ON
S2 ↓	3	OPEN CLOSE	↓	↓		OFF	↓
S3 JETTISON DEADFACE	2	GRD RESET*	-6102*	1003370-05			ON*-ON
S4 <u>RNDZ RADAR/COMM A ANT</u>	3A	DEPLOY # STOW #	-6353*	1003604-02		AUTO#	ON#-OFF#-ON#
S5 ↓	1A	ARM # SAFE #	-6151*	1003604-01			ON#-ON#
S6 ↓	1	JETT. —	-6101*	1003370-02			ON-ON
S7 <u>MAN PL BAY MECH.</u> A	1	ENABLE OFF	↓	↓			↓
S8 ↓ B	1	ENABLE OFF	—	—			
S9 <u>RADIATORS</u> LEFT LATCH	3	OPEN CLOSE	-6103*	1003370-01		OFF	ON-OFF-ON
S10 ↓ RADIATOR	3	DEPLOY STOW	↓	↓		OFF	↓
S11 ↓ RIGHT LATCH	3	OPEN CLOSE	↓	↓		OFF	↓

\* DENOTES MOMENTARY

# DENOTES LIFT-LOCK

REF. Dwg. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70 730102 36V 73A1A5	0	4	A	_____	_____	_____	3/31/26	PNL A1A5
			B	_____	_____	_____	ENG. TF Albert	
			C	_____	_____	_____	APPR. _____	

SWITCH SETTINGS							
SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PROC. PART NO	CORE LOG. SPD NO.	SEE SKETCH	DO D.I. AT SW. POS.	COMMENTS
S12 RADIATORS RIGHT RADIATOR	3	DEPLOY	-6103	1003370-01		OFF	ON-OFF-ON
		STOW					
S13 FWD SPOTLIGHT	1	ON	-6101	1003370-02			ON-ON
		OFF					
S14 OVERHEAD RNDZ/DOCKING	1	ON					
		OFF					
S15	3	FLASHING	-6103	1003370-01		DIM	ON-OFF-ON
		BRIGHT					
S16 ANNUNC.	3	AC1				OFF	
		AC2					
S17	1	BRIGHT	-6101	1003370-02			ON-ON
		DIM					
S18 LAMP TEST	4	LEFT *	-6105	1003370-04		—	ON*-OFF-ON*
		RIGHT *					
S19 ON ORBIT STATION FLOOD.	1	ON	-6101	1003370-02			ON-ON
		OFF					

REF. VL70-730102 36V73A1A5	DWG. NO.	REV. 0	PAGE 4	REV. A	DATE	ENG.	APPR.	REL. DATE 3/31/76	A1A5	TITLE
				B				ENG. TF Thibault		
				C				APPR.		

TYPE OF EQUIPMENT	NAME	DISPOSITION- PROC. PART NO.	SPD NO.	COMMENTS- TYPE	DESC.
EVENT IND	DS1 PAYLOAD BAY DOOR	MC 432-0222-		3 STATE 3A	OP-B.P.-CL
	DS2 RNDZ RADAR/COMM A ANT			3C	STO-B.P.-DPY
	DS3 RADIATORS LEFT LATCH			3G	LAT-B.P.-PL
	DS4 RADIATOR			3C	STO-B.P. DPY
	DS5 RIGHT LATCH			3G	LAT-B.P.-PL
	DS6 RADIATOR			3C	STO-B.P. DPY
POTS	R1 FWD SPOTLIGHT	ME 444-0054-1001		RHEOSTATS	
	R2 ON ORBIT STATION FLOODLIGHT				
TRANSFORMERS	T1 ON ORBIT STATION INTEGRAL LGT DISPLAYS	MC 446-0034-5001		VAR. TRANS.	
	T2 NUMERICS				
	T3 PANELS				

REF. DWG. NO. VL 70-730102 36V73A1A5	REV. 0 PAGE 4	REV. A B C	DATE	ENG.	APPR.	REL. DATE 3/31/76 ENG. TF O'Brien APPR.	TITLE PWL A1A5
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## SWITCH SETTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	PRAC. PART CHANNEL NO.	SPD. CORE NO. LOG.	SEE SKETCH	COMMENTS- DESC
S1 <u>LOSS AUDIO POWER</u>	3	AUD/TONE OFF	-6103*	1003370-01		AUD ON-OFF-ON
S2 A/G 1	3	T/R OFF				RCV
S3 ↓ 2	3	T/R OFF				RCV
S4 A/A	3	T/R OFF				RCV
S5 ICOM 1	3	T/R OFF				RCV
S6 ↓ 2	3	T/R OFF				RCV
S7 PAGE	2	PAGE* —	-6102*	1003370-05		ON*-ON
S10 PTT CONTROL	7	XMIT* ICOM	-6108*	1003370-03		— ON-OFF-ON*
S11 ↓ SPKR POWER	3	SPKR/MC OFF	-6103*	1003370-01		SPKR ON-OFF-ON

\* DENOTES MOMENTARY

REF. DWG. NO. VL70-730102 36V73A2	REV. PAGE 0 1	REV. DATE ENG. APPR. A _____ B _____ C _____	REL. DATE 3/31/76 ENG. JF. <i>Ward</i> APPR. _____	TITLE PNL A2
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⊗ ME 452-0102.

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VL70-730102			A				3/3/76	
	36V73A2			B				ENG. <i>TF. Tinkert</i>	PLA 2
				C				APPR. _____	

TYPE OF EQUIPMENT	NAME	<del>DISPOSITION</del> PROC. PART NO.	SPD. NO.	<del>COMMENTS</del> DESC.
2 sec DIG. SW	S8 OSS AUDIO VOLUME A/C 1	MC-452-0134-		2 sec DIG. SW.
↓	↓	↓		↓
3 sec DIG. SW	S9 A/A	MC-452-0134-0004		3 sec DIG. SW
↓	↓	↓		↓
	ICOM 1			
↓	↓	↓		↓
10 POS. POT	R1 VOX SENS			10 POS. POTENTIOMETER
↓	R2 MASTER CCU VOLUME			↓
	R3 MASTER SPEAKER VOLUME			
4 POS ROT. SW	S12 XMIT ICOM MODE	ME452-0093H-5024	1003512-01	4 POS. ROT SW

REF. VL70-730102 36V73A2	DWG. NO.	REV. 0	PAGE 4	REV. A	DATE	ENG.	APPR.	REL. DATE 3/31/76	TITLE PNL A2
				B				ENG. <u>TE. 07/6/76</u>	
				C				APPR. _____	

[illegible]

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		0	4	A				3/31/76	PNL A2
36V73A2				B				TF 9/1/82	
				C					

TYPE OF EQUIPMENT	NAME	<del>DISPOSITION</del> PROC PART NO.	SPD NO.	<del>COMMENTS</del> DESC.
CRT	PNL A3A1			CCTV

REF. VL70-730102 36V73A3A1	DWG. NO.	REV. 0	PAGE 4	REV. A B C	DATE _____ _____ _____	ENG. _____ _____ _____	APPR. _____ _____ _____	REL. DATE 3/31/76	ENG. <i>TF</i>	APPR. <i>Chert</i>	TITLE PNL A3A1
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MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	<del>DISPOSITION</del> PROC. PART NO.	SPD. NO.	<del>COMMENTS</del> DESC.
CRT	PNL A3A2			CCTV

REF. VL70-730102 36V73A3A2	DWG. NO.	REV. 0	PAGE 4	REV. A B C	DATE   	ENG.   	APPR.   	REL. DATE 3/31/76 ENG. TF [Signature] APPR. _____	TITLE PNL A3A2
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\* DENOTES MOMENTARY POS

ME 452-0102

NAME Δ 4 A1 SIMULATOR CMS PAGE 1 OF 2

MISCELLANEOUS COMPONENTS

[illegible]

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VL70-730102	0	4	A				3/31/76	PNL A4
	36V73A4A1			B				TF Hunt	
				C					

# DENOTES LIFT-LOCK      \* ME 452-0102 -

PANEL A6

SWITCHINGS						
SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PROC. PART NO.	DORE LOC. SPR. NO.	SEE SKETCH	COMMENTS DESC
S3 ATT REF	LT PB	ATT REF	ME452-0061			SINGLE LEGEND
		—				
S8 ORBITAL DAP SELECT		A				
		—				
S9		B				
		—				
S10 CONTROL		AUTO				
		—				
S11		MAN				
		—				
S12 RCS JETS		NORM				
		—				
S13		VERN				
		—				
S14 MAN MODE ROTATION ROLL		DISC RATE				
S15 PITCH		DISC RATE				
S16 YAW		DISC RATE				
S17 ROLL		ACCEL				

REF. VL70-730102 36V73A6A1	DWG. NO.	REV. 0	PAGE 4	REV. A	DATE	ENG.	APPR.	REL. DATE 3/31/76	PNL A6	TITLE
				B				ENG. IF <i>What</i>		
				C				APPR.		

SWITCHINGS							
SWITCH NAME		TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PROC. PART.	CORE TRC SPD NO	SEE SKETCH	COMMENTS DESC
S18	MAN MODE ROTATION	PITCH	L.T. PB	ACCEL	ME452-0061		SINGLE LEGEND
				-			
S19		YAW		ACCEL			
				-			
S20		ROLL		PULSE			
				-			
S21		PITCH		PULSE			
				-			
S22		YAW		PULSE			
				-			
S26	TRANSLATION	X		HIGH			
				-			
S27		Y		HIGH			
				-			
S28		Z		HIGH			
				-			
S29		X		NORM			
				-			
S30		Y		NORM			
				-			
S31		Z		NORM			
				-			

REF. VL70-730102 36V73 A6A1	DWG. NO.	REV. 0	PAGE 4	REV. A	DATE	ENG.	APPR.	REL. DATE 3/31/76	TITLE PNL A6
				B				ENG. TF Whit	
				C				APPR.	

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		0	4	A				3/31/76	A6
36V73A6A1				B				TF. <i>Robert</i>	
				C					

TYPE OF EQUIPMENT	NAME	<del>DISPOSITION</del> PROC. PART NO.	SPD NO.	COMMENTS DESC
ADI	A6A1A2 ADI	MC 432-0235	582984	GFE
ROT SW.	32 DATA BUS SELECT	ME 452-00934-5024	1003512-01	4 POS. ROTARY SW.

REF. DWG. NO. VL70-730102 36V73A6A1	REV. 0 PAGE 4	REV. DATE ENG. APPR. A _____ B _____ C _____	REL. DATE 3/31/26 ENG. TF. <i>Robert</i> APPR. _____	TITLE PNL A6
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REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730102 36V73A7A1		0	4					3/31/76	PNL A7 RHC
		A							
		B						ENG. <i>TF Olenchuk</i>	
		C						APPR. _____	

PANEL A7
SIMULATOR SMS
PAGE 1 OF 1

## SWITCH LISTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PROC PART NO.	CORE-LOC. SPD NO.	SEE SKETCH	NO. OF AT SW POS.	COMMENTS-DESC.
CRYO HEATER K1 Q <sub>2</sub> A ↓ B ↓ RESET ↓ H <sub>2</sub> A ↓ B ↓ K2 O <sub>2</sub> A ↓ B ↓ RESET ↓ H <sub>2</sub> A ↓ B ↓ ↓ ↓ ↓	3	AUTO ON	-6103 ⊕	1003370-01		OFF	ON-OFF-ON
	3	AUTO ON	↓	↓		OFF	↓
	4	RESET* TEST*	-6105 ⊕	1003370-04		OFF	ON*-OFF-ON*
	3	AUTO ON	-6103 ⊕	1003370-01		OFF	ON-OFF-ON
	3	AUTO ON	↓	↓		OFF	↓
	3	AUTO ON	↓	↓		OFF	↓
	3	AUTO ON	↓	↓		OFF	↓
	3	AUTO ON	↓	↓		OFF	↓
	4	AUTO ON	-6105 ⊕	1003370-04		OFF	ON*-OFF-ON*
	3	AUTO ON	↓	↓		OFF	↓
	3	AUTO ON	↓	↓		OFF	↓
	1	ON OFF	-6101 ⊕	1003370-02			ON-ON

\* DENOTES MOMENTARY

REF. DWG. NO. VL70-730102 36V73A11A1	REV. PAGE 0 4	REV. DATE A	ENG.	APPR.	REL. DATE 3/31/76	TITLE PNC A11
		B			ENG. <u>TE 2/6/71</u>	
		C			APPR. _____	

⊗ ME452-0102-

PANEL All SIMULATOR SMS PAGE 2 OF 3

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	<del>DISPOSITION</del> PROC. PART NO.	SPD NO.	COMMENTS- DESC
POT ↓	TONE	ME444-0059- 2001 ↓		POT ↓
	VOLUME			
JACK ↓	MS COMM			JACK ↓
	OOS COMM			
	UTILITY POWER			

REF. VLT0-730102 36V73A11A1	DWG. NO.	REV. 0	PAGE 4	REV. A	DATE	ENG.	APPR.	REL. DATE	TITLE PNL A11
				B				ENG. TF <i>Robert</i>	
				C				APPR.	

SWITCH SETTINGS							
SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PROC PART NO	CORE-LOG SPD NO.	SEE SKETCH	NO DI AT SW. POS	COMMENTS-DESC
APU HEATERS TANK FUEL LINE 1A ↓ 2A ↓ 3A ↓ 1B ↓ 2B ↓ 3B ↓ GAS GEN FUEL PUMP 1 ↓ 2 ↓ 3 ↓ LUBE OIL LINE 1 ↓ 2	1	AUTO	-6101	1003370-02	TOGGLE SW TIP		ON-ON
		OFF	—	—			↓
	1	AUTO	↓	↓			↓
		OFF	—	—			ON-OFF-ON
	3	AUTO	-6103	1003370-01		?	
		OFF					
	1	AUTO	-6101	1003370-02			ON-ON
		OFF	—	—			↓
	1	AUTO	↓	↓			
		OFF	—	—			
	1	AUTO	↓	↓			
		OFF	—	—			
2	3	A AUTO	-6103	1003370-01		OFF	ON-OFF-ON
		B AUTO					
	3	A AUTO				OFF	
		B AUTO					
	3	A AUTO				OFF	
		B AUTO					
3	3	A AUTO				OFF	
		B AUTO					
	3	A AUTO	↓	↓		OFF	
		B AUTO					

⊗ ME 452-0102

REF. DWG. NO. VL70-730102 36V73A12	REV. PAGE 0 4	REV. DATE A	ENG.	APPR.	REL. DATE 3/31/76	TITLE
		B			ENG. TF 0161.4	PNL A12
		C			APPR.	

## SWITCHINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PROC. PART NO	CORE LOG SPD NO.	SEE SKETCH	NO DI AT SW POS	COMMENTS DESC
LUBE OIL LINE 3	3	A AUTO	-6103	1003370-01		OFF	ON-OFF-ON
		B AUTO	-				
CIRC PUMPS 1	1	MN A	-6101	1003370-02			ON-ON
		MN B	—	—			
2	1	MN B	—	—			
		MN C	—	—			
3	1	MN C	—	—			
		MN A	—	—			
HYDRAULIC ACTUATOR HEATERS							
ELEVONS L OUTBD	3	A AUTO	-6103	1003370-01		OFF	ON-OFF-ON
		B AUTO					
L INBD	3	A AUTO				OFF	
		B AUTO					
R INBD	3	A AUTO				OFF	
		B AUTO					
R OUTBD	3	A AUTO				OFF	
		B AUTO					
RUDDER SPD BK	3	A AUTO				OFF	
		B AUTO					
BODY FLAP	3	A AUTO				OFF	
		B AUTO					
ET UMB	3	A AUTO				OFF	
		B AUTO					

⊕ ME 452-0102-

REF. VL70 730102 36V 73A12A1	DWG. NO.	REV. 0	PAGE 4	REV.	DATE	ENG.	APPR.	REL. DATE 3/31/76	TITLE PNL A12
				B				ENG. TT 076. Ant	
				C				APPR.	

[illegible]

\* DENOTES MOMENTARY POS.  
# DENOTES LOCKED POS.

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102	36V73A12A1	0	4	A				3/31/76	PNL A12
				B				ENG. TF J. J. J.	
				C				APPR.	

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		0	4	A				3/31/76	PNL 112
36V73A12A1				B				TF <i>[Signature]</i>	
				C				APPR. _____	

SWITCH STINGS

	SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PROC PART NO	CORE LOG NO.	SEE SKETCH	COMMENTS DESC.
S1	MN A POWER FWD 1	1	ON	- 6101	1003370-02		ON-ON
			OFF				
S2	MID 1/4 A	1	ON				
			OFF				
S3	AFT 1	1	ON				
			OFF				
S4	MN B POWER FWD 2	1	ON				
			OFF				
S5	MID 2/4 B	1	ON				
			OFF				
S6	AFT 2	1	ON				
			OFF				
S7	MN C POWER FWD 3	1	ON				
			OFF				
S8	MID 3	1	ON				
			OFF				
S9	AFT 3	1	ON				
			OFF				

⊗ ME 452-0102 -

REF. DWG. NO. VL70-730102 36V73A13A1	REV. PAGE 0 4	REV. DATE A _____ B _____ C _____	ENG. _____	APPR. _____	REL. DATE <u>3/31/76</u> ENG. <u>J. O. Best</u> APPR. _____	TITLE PNL A13
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CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CH. E	GORE -LOG-	FEEDER BUS	SEE SKETCH	TS
MOTOR CONTROL ASSEMBLIES							
AC I POWER	1		MC-454- 0026-1010	1003396-01			
MECH. MOTORS FWD I							
MID 1/4 A	2						
AFT I	3						
RCS FWD I $\phi A$	4						
$\phi B$	5						
$\phi C$	6						
OMS RCS AFT I $\phi A$	7						
$\phi B$	8						

REF. DWG. NO. VL70-730102 36V73A13A1	REV. 8 PAGE 4	REV. A B C	DATE	ENG.	APPR.	REL. DATE 3/31/76 ENG. TF Orlant APPR.	TITLE PNL A13
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## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CH. PROC. PART NO.	CORE LOC. NO.	FEEDER BUS	SEE SKETCH	CL. — IS
<u>MOTOR CONTROL ASSEMBLIES</u>							
AC 1 POWER OMS/RCS AFT 2 $\phi$ C	9		-1010 $\oplus$	100339601			
AC 2 POWER MECH MOTORS	10						
FWD 2							
MID 2/4 B	11						
AFT 2	12						
RCS FWD 2 $\phi$ A	13						
$\phi$ B	14						
$\phi$ C	15						
OMS/RCS AFT 2 $\phi$ A	16						

 $\oplus$  MC454-0026-

REF. VL70	DWG. NO. 730102	REV. 0	PAGE 4	REV. A	DATE	ENG.	APPR.	REL. DATE 3/31/76	TITLE PNL A13A1
36V73A13A1				B				ENG. TF <i>Thurman</i>	
				C				APPR.	

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CH	CORE LOG.	FEEDER BUS	SEE SKETCH	COMMENTS
AC2 POWER QMS/RCS AFT 2 ØB	17		-1010	1003396-01			
ØC	18						
AC3 POWER MECH. MOTORS	19						
FWD 3	20						
MID 3	21						
AFT 3	22						
RCS FWD 3 ØA	23						
ØB	24						
ØC							

MC 454-0026-

REF. DWG. NO. VL70-730102	REV. PAGE	REV. DATE	ENG.	APPR.	REL. DATE 3/31/76	TITLE
					ENG. TF Norbert	A13A1
					APPR.	

(\*) MC 454 - 0026

PANEL 412

SWITCH LISTINGS							
SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL	CORE LOG	SEE SKETCH	NO DI AT SW POS	COMMENTS
S1 OMS/RCS HEATERS MODULE LEFT AFT 1	3	A AUTO B AUTO	-6103	1003370-01		OFF	ON-OFF-ON
S2	3	A AUTO B AUTO				OFF	
S3 FWD	3	A AUTO B AUTO				OFF	
S4 RIGHT AFT 1	3	A AUTO B AUTO				OFF	
S5	3	A AUTO B AUTO				OFF	
S6 OMS AUX	3	A B					
S7 XFD LINES A	1	AUTO OFF	-6101	1003370-02			ON-ON
S8 B	1	AUTO OFF					
S9 AFT RCS THRUSTER 1	1	AUTO OFF					
S10 2	1	AUTO OFF					
S11 3	1	AUTO OFF					

⊗ ME 452-0102-

REF. VLT 70 736102 36V73A14A1	DWG. NO.	REV. PAGE	REV. DATE	ENG.	APPR.	REL. DATE 3/31/76	TITLE PNL A14
			A			ENG. JT Herbert	
			R			APPR.	
			C				

		SWITCH		STINGS					
SWITCH NAME		TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PROC. PART NO.	CORE LOC. SPD. NO.	SEE SKETCH	NO DI AT SW POS	COMMENTS-DESC	
S12	OMS/RCS HEATERS AFT RCS THRUSTERS	4	1	AUTO OFF	-6101 <sup>Ⓢ</sup>	1003370-02			DN-DN
S13	↓	5	1	AUTO OFF	—	—			
S14	FWD RCS THRUSTERS	1	1	AUTO OFF	—	—			
S15		2	1	AUTO OFF	—	—			
S16		3	1	AUTO OFF	—	—			
S17		4	1	AUTO OFF	—	—			
S18	↓	5	1	AUTO OFF	—	—			
S19	FUEL CELL PURGE CONTROL GPC SEQ	1	1	START* —	↓	↓			
S21	PURGE VLV HEATER	3	3	GPC ON	-6103 <sup>Ⓢ</sup>	1003370-01	OFF		ON-OFF-ON
S22	↓	1	3	OPEN CLOSE	↓	↓	OFF		
S23	↓	2	3	OPEN CLOSE	↓	↓	OFF		

\* ME 452-0102-

REF. VLT0-730102 36V73A14A1	DWG. NO.	REV. 0	PAGE 4	REV. A	DATE	ENG.	APPR.	REL. DATE 3/31/76	TITLE
				B				ENG. TF Gilbert	
				C				APPR.	PNL A14

REF.	DWG. NO.	REV.	PAGE		REV.	DATE	ENG	APPR.	REL. DATE	TITLE
VL70-730102 36V73A14A1		0	4	A					3/31/76	
				B					JF JHart	PNL A14
				C						

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION PROC PART NO.	SPD NO.	COMMENTS DESC.
EVENT IND.	FUEL CELL PURGE CONTRL. AUTO SEQ	MC432-0222		2 STATE 2C GRAY B.P

REF. VL70-730102 36V73A14A1	DWG. NO.	REV. 0	PAGE 4	REV. A	DATE	ENG.	APPR.	REL. DATE 3/31/76	ENG. <i>TF Robert</i>	APPR.	TITLE PNL A14
				B							
				C							

SWITCHINGS								
SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PROC. PART NO.	CORE LOG. NO.	SEE SKETCH	NO DI AT SW POS.	COMMENTS	DESC
CRYO HTR KIT 3 O <sub>a</sub> A	3	AUTO	-6103 ⊕	1003370-01	TGGLE SW TYP	OFF		ON-OFF-ON
		ON						
↓ B	3	AUTO	↓			OFF		↓
		ON						
RESET	4	RESET*	-6105 ⊕	1003370-04		OFF		ON*-OFF-ON*
		TEST*						
H <sub>2</sub> A	3	AUTO	-6103 ⊕	1003370-01		OFF		ON-OFF-ON
		ON						
↓ B	3	AUTO	↓			OFF		
		ON						
4 O <sub>a</sub> A	3	AUTO	↓			OFF		
		ON						
↓ B	3	AUTO	↓			OFF		
		ON						
RESET	4	RESET*	-6105 ⊕	1003370-04		OFF		ON*-OFF-ON*
		TEST*						
H <sub>2</sub> A	3	AUTO	-6103 ⊕	1003370-01		OFF		ON-OFF-ON
		ON						
↓ B	3	AUTO	↓			OFF		
		ON						

\* Denotes momentary pos.

⊕ ME 452-0102-

REF. VL70-730102 36V73A15A1	DWG. NO.	REV. 0	PAGE 4	REV. A	DATE	ENG.	APPR.	REL. DATE 3/31/76	TITLE
				B				ENG. JF. J. J. J.	PNL A15
				C				APPR.	

SWITCH STINGS							
SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	PROC CHANNEL PART NO.	CORE LOG NO.	SEE SKETCH	NO DI AT SW POS	COMMENTS DESC
CRYO HTR KIT 5 O <sub>2</sub> A	3	AUTO ON	1003370-01	-6103			ON-OFF-ON
B	3	AUTO ON					
RESET	4	RESET* TEST*	1003370-04	-6105			ON*-OFF-ON*
H <sub>2</sub> A	3	AUTO ON	1003370-01	-6103			ON-OFF-ON
B	3	AUTO ON					
6 O <sub>2</sub> A	3	AUTO ON					
B	3	AUTO ON					
RESET	4	RESET* TEST*	1003370-04	-6105			ON*-OFF-ON*
H <sub>2</sub> A	3	AUTO ON	1003370-01	-6103			ON-OFF-ON
B	3	AUTO ON					

\* Denotes Nom. Pos.

ME452-0102-

REF. VLT-730102	DWG. NO.	REV. 0	PAGE 4	REV. A	DATE	ENG.	APPR.	REL. DATE 3/31/76	TITLE
				B				ENG. TF 9/6/76	PNL A15
				C				APPR.	

SWITCH STINGS								
SWITCH NAME			TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PROC PART NO.	CORE LOG NO.	SEE SKETCH	NO DI AT SW COMMENTS DESC
CRYO HTR KIT 7	O <sub>2</sub>	A	3	AUTO	-6103	1003370-01		OFF ON-OFF-ON
				ON				
		B	3	AUTO				OFF
				ON				
RESET			4	RESET*	-6105	1003370-04		OFF ON*-OFF-ON*
				TEST*				
	H <sub>2</sub>	A	3	AUTO	-6103	1003370-01		OFF ON-OFF-ON
				ON				
		B	3	AUTO				OFF
				ON				
8	O <sub>2</sub>	A	3	AUTO				OFF
				ON				
		B	3	AUTO				OFF
				ON				
RESET			4	RESET*	-6105	1003370-04		OFF ON*-OFF-ON*
				TEST*				
	H <sub>2</sub>	A	3	AUTO				OFF
				ON				
		B	3	AUTO				OFF
				ON				
CRYO HTR KIT 9	O <sub>2</sub>	A	3	AUTO				OFF
				ON				

\* DENOTES MOM POS      ME452-0102-

REF. VL70-730102	DWG. NO. 0	REV. 4	REF. A	DATE	ENG.	APPR.	REL. DATE 3/31/76	TITLE
			B				ENG. TF	PNL A15
			C				APPR.	

## SWITCH SETTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PROC PART NO.	GORE LOG NO.	SEE SKETCH	NO DI AT SW. POS	COMMENTS-DESC
CRYO HTR KIT 9 O <sub>2</sub>	B	3	AUTO	-6103 <sup>⊗</sup>	1003370-01	OFF	ON-OFF-ON
			ON				
RESET	4	4	RESET*	-6104 <sup>⊗</sup>	1003370-04	OFF	ON*-OFF-ON*
			TEST*				
H <sub>2</sub>	A	3	AUTO	-6103 <sup>⊗</sup>	1003370-01	OFF	ON-OFF-ON
			ON				
	B	3	AUTO			OFF	
			ON				
10 O <sub>2</sub>	A	3	AUTO			OFF	
			ON				
	B	3	AUTO			OFF	
			ON				
RESET	4	4	RESET*	-6104 <sup>⊗</sup>	1003370-04	OFF	ON*-OFF-ON*
			TEST*				
H <sub>2</sub>	A	3	AUTO	-6103 <sup>⊗</sup>	1003370-01	OFF	ON-OFF-ON
			ON				
	B	3	AUTO			OFF	
			ON				
UTILITY PWR AC AC3	1	1	AUTO	-6101 <sup>⊗</sup>	1003370-02	OFF	ON-ON
			ON				
DC MNC	1	1	AUTO			OFF	
			ON				

\* DENOTES MOM POS.

⊗ ME452-0102-

REF. VI.70-730102 36V73A15A1	DWG. NO.	REV. 0	PAGE 4	REV. A	DATE	ENG.	APPR.	REL. DATE 3/31/76	TITLE
				B				ENG. TF [Signature]	PNL A15
				C				APPR. [Signature]	

⑧ = ME 452 - 0102

PANEL A15 SIMULATOR SMG PAGE 5 OF 6

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730102		0	4	A				3/31/76	PNL A15
36V73A15A1				B				IF Oulert	
				C					

## SWITCH SETTINGS

SWITCH NAME		TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL SPEC NO	CORE LOC. SPD PART NO	SEE SKETCH	No PI AT THIS POSITION	COMMENTS DESCRIPTION
S1	CRT 2	3	ON	Ⓢ-6103	1003370-01		STBY	ON - OFF - ON
	Power		OFF					
S2	MAJ FUNC	3	GNC				SM	
	CRT 3		PL					
S3	Power	3	ON				STBY	
			OFF					
S4	MAJ FUNC	3	GNC				SM	
	CRT 2		PL					
S5	Power	3	ON				STBY	
			OFF					
S6	MAJ FUNC	3	GNC				SM	
			PL					
S7	Left CRT Cell	1	1	Ⓢ-6101	1003370-02			ON - ON
			3					
S8	Right CRT Cell	1	3					
	EVEN Timer		2					
S9	Mode	7	UP	Ⓢ-6002	1003370-03		DOWN	ON - OFF - ON
			* Test					
S10	Control	4	* Start	Ⓢ-6105	1003370-01		[N]	
			* Stop					
S11	Timer	4	* Set				[N]	
			* Reset					

\* = mom, Ⓢ = ME 450-0102

[N] = Null

REF.	DRG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		2	2	A				3/26/76	PANEL
35073A2A2		12-12-75		B				mmw Renden	C2A2
				C					

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION	COMMENTS	
		SPEC NO	SPE PART NO	DESCRIPTION
KEY BOARD	PANEL C2A1 KEY BOARD	MC615-0007		4 X 9 SWITCHES
↓	PANEL C2A3 KEY BOARD	↓		↓
S12 DIGITAL SW	PANEL C2A2 TIMER SET	MC452-0134-0005		4 SECS. (5-9-59)

ORIGINAL PAGE IS  
OF POOR QUALITY

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-73 0102		2	2	A				3/26/76	PANEL
35V 73 A2A1		12-12-76		B				ENG. <i>Mowbray</i>	C2A1, C2A2,
35V 73 A2A2				C				APPR. _____	C2A3
35V 73 A2A3									

## SWITCH LISTINGS

[illegible]

F = Locked Position  
⑥ = ME 452-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730107		1	2	A				3/26/76	PANEL
35 V 73 A 3 A1		12-12-75		B				Mr. Rieker	E 3 A 1.
				C					

## SWITCH LISTINGS

SWITCH NAME		TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL SPEC NO	CORE LOC SPU PART NO	SEE SKETCH	NO. OF AT THIS POSITION	COMMENTS DESCRIPTION
<u>FCS CHANNEL</u>			OVERRIDE	⊗-635			# AUTO	ON - OFF - ON
S1	1	12	OFF					
			OVERRIDE				# AUTO	
S2	2	2	OFF					
			OVERRIDE				# AUTO	
S3	3	12	OFF					
			OVERRIDE				# AUTO	
S4	4	12	OFF					
<u>MAIN ENGINES</u>			ENABLE	⊗-6103	1003370-01		AUTO	ON-OFF-ON
S5	<u>LIMIT SHUT DN</u>	3	INHIBIT					
			* UP	⊗-			# AUTO/OFF	* ON - OFF - * ON
S9	BODY FLAP	9	* DOWN					
			* L	⊗-6105	1003370-04		[N]	* ON - OFF - * ON
S10	ROLL TRIM	4	* R					
			* DOWN				[N]	
S11	PITCH TRIM	4	* UP					
<u>MAIN ENGINES SHUT DOWN</u>		PUSH-BUTTON						
S6	2							
S7	1							
S8	3							

# = LOCKED POSITION ⊗ = ME 452-0102

\* = MOM  
[N] = NORM POSITION

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	YL 70-73 0102	2	2	A				3/26/76	PANEL
	35 V 73 A3A2	12-12-75		B				ENG. JTW/Quin	E3A2
	C3A2			C				1 OF 1	

### MISCELLANEOUS COMPONENTS

[illegible]

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
01-0-00000		1	2	A				3/26/76	PANEL
300-0-00000		12-12-75		B				MAN RANKER	C3A3
				C					

## SWITCH SETTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL SPEL NO	CORE LOC. SPD PART NO	SEE SKETCH	NO D1 AT THIS POSITION	COMMENTS-DESCRIPTION
BATTERY		ON	④-6101	1003370-02			ON - ON
1	1	OFF	—	—			
2	1	ON	—	—			
2	1	OFF	—	—			
3	1	ON	—	—			
3	1	OFF	—	—			
4	1	ON	—	—			
4	1	OFF	—	—			
CAUTION! WARNING		* READ	④-6105	1003370-04		[N]	* ON - OFF - ON
MEMORY	4	* CLEAR					
		ACK	④-6103	1003370-01		NORM	
MODE	3	ASCENT					
AIR DATA PROBE		DEPLOY HEAT	④			DEPLOY	ON - OFF - # ON
LEFT	11	# STOW					
		DEPLOY HEAT				DEPLOY	
RIGHT	11	# STOW					
	LIFT LOCK TYPE?	ALL				CRITICAL	
UPLINK BLOCK		NONE	—	—			
		ON	④-6101	1003370-02			ON - ON
MASTER DFI POWER	1	OFF	—	—			

\* = MOM

④ ME 450-0102

[N] = NULL POSITION

# = LOCKED POSITION

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-73010		2	2	A				3/26/76	PANEL
35 V73A3A5		1272-75		B				ENG. <i>max linker</i>	C3A5
				C				APPR. _____	

## SWITCH STINGS

[illegible]

⑧ = ME 452-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VZ 70-73 0102			A				3/26/76	PANEL C3 A5
	35 V73 A3A5			B				MW Ginter	
				C					

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION SPEC NO	SPD PART NO	COMMENTS DESCRIPTION
EVENT INDICATORS	DFI RECORDER: TAPE MOTION PCM	MC432-0222		2 STATE GRAY - B.P.
	↓	↓		↓
	WIDE BAND ASCENT	-		
	↓	↓		↓
	WIDE BAND MISSION	-		

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-73 0102		1	2	A				3/26/76	PANEL
35V 73 43 A5		12-12-75		B				ENG. <u>M. W. Rinker</u>	C3 A5
				C				APPR. _____	

## SWITCH SETTINGS

SWITCH NAME		TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL SPEL NO	CORE LOC. S22 PART NO	SEE SKETCH	COMMENTS DESCRIPTION
514	MANUEL MODE ROTATION PITCH PULSE	PUSH BUTTON		ME 452-0061			
519	YAW DISC RATE			-			
513	ACCEL			-			
515	PULSE			-			
516	TRANSLATION X HIGH			-			
519	NORM	ORIGINAL PAGE IS OF POOR QUALITY		-			
522	PULSE			-			
517	Y HIGH			-			
520	NORM			-			
523	PULSE			-			
518	Z HIGH			-			

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE <u>9/24/76</u>	TITLE <b>PANEL C3 A6</b>
VL70-73 0102		2		A				ENG. <u>MW Rinker</u>	
35473 A3A6		12-12-75		B				APPR. _____	
				C					

## SWITCH LISTINGS

	SWITCH NAME	VDE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL		SEE SKETCH	COMMENTS DESCRIPTION
				SPEC NO	CORE LOC SPD PART NO		
S1	ORBITAL DAP SELECT A	PUSH BUTTON		ME 452-0061			
S2	B			-			
S3	CONTROL AUTO			-			
S4	MAN RCS DET.			-			
S5	NORM			-			
S6	VERN			-			
S7	MANUEL MODE ROTATION ROLL DISCFATE			-			
S10	ACCEL			-			
S13	FULSE			-			
S8	PITCH DISCFATE			-			
S11	ACCEL			-			

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-73 0102		2	2	A				3/24/76	PANEL
35 VTE A246		12-12-75		B				Now under	C3AG
				C				APPR.	

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		7	2	A				3/24/76	PANEL
				B				ENG. <u>M W Rinder</u>	
38V73 A3A6		12-12-75		C				APPR. _____	C3A6

## SWITCH LISTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL SPEC NO	CORE LOC. SPD PART NO	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS DESCRIPTION
51 SRB SEPARATION	1	MAN AUTO	⊗-6101	1003370-02			ON-ON
		AUTO	—	—			
53 ET SEPARATION	10	MAN	⊗-6252				ON-ON
		# AUTO	—	—			
55 YAW TRIM	4	* L	⊗-6105	1003370-04		(N)	* ON-OFF-ON
		* R					
56 AUDIO CENTER	3	1	⊗-6103	1003370-01		(N)	ON-OFF-ON
		2					
57 <del>OLPCMMU</del>	3	1				(N)	
PWR		2					
58	3	G-PC				FIXED	
FORM/IT		PROGRAM					
59 5-BAND FM	1	UPLINK	⊗-6101	1003370-02			ON-ON
CONTROL		PANEL	—	—			
52 SRB SEPARATION	PUSH		ME 452-0061				
SEP	BUTTON		—				
54 ET SEPARATION							
SEP							

# = LOCKED POSITION ⊗ = ME 452-0102

X = MOM

DNJ = null

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730102		2	2	A				3/24/76	PANEL
35V73A3A7		12-12-75		B				now under	C3A7
				C				APPR.	

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-23010		1	2	A				3/26/76	PANEL
350.3 A3A7		13-12-75		B				TDW Bunker	
				C					C3A7

(\*) ME 452-0102

PANEL F1 SIMULATOR SM5 PAGE 1 OF 2

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ING.	APPR.	REL. DATE	TITLE
	16-10-730102-1			A				3/29/76	PANEL F1
				B				ENG <i>[Signature]</i>	
				C				APPR. <i>[Signature]</i>	

## SWITCH LISTINGS

	SWITCH NAME	TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL SPEC. NO.	CORE LOC SPD P/N	SEE SKETCH	COMMENTS DESCRIPTION
S2	PITCH (PANEL TITLE) AUTO	PUSH BUTTON		⊗ -	⊗ - 03		SINGLE LENSE
S3	CSS	"		-	- 02		" "
S4	DIR	"		-	- 04		" "
S5	ROLL/YAW (PANEL TITLE) AUTO	"		-	- 03		SINGLE LENSE
S6	CSS	"		-	- 02		" "
S7	DIR	"		-	- 04		" "
S8	SPD BK THROT (PANEL TITLE) AUTO	"		-	- 01		SPLIT LENSE
S8	MAN	"		-			
S9	BODY FLAP (PANEL TITLE) AUTO	"		-	- 01		SPLIT LENSE
S9	MAN	"		-			
S1	MASTER ALARM	"		-	100 3392-01		SINGLE LENSE

⊗ = ME 452 - 0061

⊕ = 100 3394

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VE 70-730102-1			A				3/27/76	PANEL F2
				B				ENG. <i>64</i>	
				C				APPR.	

MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION SPEC. NO.	SPD P/N	COMMENTS DESCRIPTION
ANNUNCIATOR	RANGE SAFE	MC434-0075		XDS3
	↓ ARM			2 STATE -
	↑ SAME ANNUN			SPLIT LENSE
"	EVENT SEQUENCE	ANNUN. ASSEMBLY		XDS1
	1	ML434-0079-0001	2058720	5 MATRIYED
	2	LEGEND ASSEMBLY		LENSES
	3	MC434-0070-000	NOTE 1	
	4			
	5			
"	NWS FAIL	MC434-0075 -0001	2058719	XDS2
				SINGLE LENSE

NOTE 1 - LEFT OUT FINAL DIGIT BECAUSE OF POSSIBLE CHANGE

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VL70-730102-1			A				5/27/76	PANEL F2
				B				64	
				C					

## SWITCH STINGS

	SWITCH NAME	TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL SPEC. NO	PORE LOG SPD P/N	SEE SKETCH	COMMENTS DESCRIPTION
S2	PITCH (PANEL TITLE) AUTO	PUSH BUTTON		⊗ -	⊗ - 03		SINGLE LENSE
S3	CSS	"		-	- 02		" "
S4	DIR	"		-	- 04		" "
S5	ROLL/YAW (PANEL TITLE) AUTO	"		-	- 03		SINGLE LENSE
S6	CSS	"		-	- 02		" "
S7	DIR	"		-	- 04		" "
S8	SPD BK THROT (PANEL TITLE) AUTO	"		-	- 01		SPLIT LENSE
S8	MAN			-			
S9	BODY FLAP (PANEL TITLE) AUTO	"		-	- 01		SPLIT LENSE
S9	MAN			-			
S1	MASTER ALARM	"			1003392-01		SINGLE LENSE

⊗ = ME 452 - 0061

⊗ = 1003394

REF.	DWG. NO.	REV.	PAGE	REV	DATE	ENG.	APPR	REL. DATE	TITLE
	VL70-730102-1			A				3/29/76	PANEL F4
				B				84	
				C					
								APPR.	

PANEL F4

SIMULATOR SM S

PAGE 1 OF 2

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION SPEC NO.	SPD P/N	COMMENTS DESCRIPTION
ANNUNCIATOR	RANGE SAFE	MC434-0075 -		XDS 3 2 STATE -
	↓ ARM			SPLIT LENSE
"	EVENT SEQUENCE	ANNUN. ASSEMBLY		XDS 1
	1	MC434-0079-0001	2058720	5 SEPARATE
	2	LEGEND ASSEMBLY		LENSES
	3	MC434-0079-0001	NOT: 2	
	4			
	5			
"	ANTI SKID FAIL	MC434-0075 -0002	2058719	XDS 2 SINGLE LENSE

NOTE 2 - LAST DIGIT LEFT OUT BECAUSE OF POSSIBLE CHANGE

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VL70-730102-1			A				3/29/76	PANEL F4
				B					
				C					

MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION SPEC NO	COMMENTS	
			SPD PART NO	DESCRIPTION
TMC (ASA2)	TRANSLATIONAL HAND CONT.	MC621-0043		
OUTLET (SAI)	CABIN AIR OUTLET			

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		1	1	A				4/1/76	PANEL F5
34V 73A5				B				ENG. <i>MMW</i>	
		12-12-75		C				APPR.	

TYPE OF EQUIPMENT	NAME	DISPOSITION SPEC. NO.	SPD P/N	COMMENTS DESCRIPTION
SWITCH-	DATA BUS SELECT	ME452-		
	1	0093-5025	1003512-02	2 POLE, 4 POS.
ROTARY	2			
S2	3			
(6A2)	4			
INDICATOR, EVENT	LANDING GEAR LEFT	MC432-0222		DS1 UP-BP-DN
(6A5)	NOSE			DS2 UP-BP-DN
	RIGHT			DS3 UP-BP-DN
INSTRUMENT FLIGHT	AMI	MC432-0224	2058913	
(6A3)	ADI	MC432-0235	582884	GFE
(6A4)	AVVI	MC432-0226	2058914-02	
(6A6)	HSI	MC432-0218	2058912-01	

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	UL70-730102-1			A				3/29/76	PANEL FG
				B				ENG	
				C				APPR.	

## SWITCH SETTINGS

	SWITCH NAME	TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL SPEC. NO.	CORE LOC. SPD PIN	SEE SKETCH	NO DI @ THIS POS.	COMMENTS DESCRIPTION
S3	ATT REF (6A1)	PUSH BUTTON						SINGLE LENSE
S7	AIR DATA SELECT	3	LEFT RIGHT	6103	1003370-01		NAV	ON-OFF-ON
S5	ADI ATTITUDE	3	INRTL REF				LVLH	
S6	ERROR	3	HIGH LOW				MED	
S7	RATE	3	HIGH LOW				MED	ON-OFF-ON
S1	INSTRUMENT POWER (6A1)		FLTMAPS FLT	6103	1003370-01		OFF	ON-OFF-ON
S3	HST SELECT MODE (6A5)	3	ENTRY APPROACH	6103	1003370-01		TEAM	ON-OFF-ON
S4	SOURCE	3	TACAN MLS				NAV	ON-OFF-ON
S5	SOURCE (6A5)	3	1 3				2	ON-OFF-ON
S1	FLT CNTRL POWER (6A7)	10	ON # OFF	6252				ON-ON
S4	RADAR ALTM	1	1 2	6101	1003370-02			ON-ON

\* MOM

⊗ ME 452-0102

# = LOCKED POS.

[N] = NEUTRAL

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	U70-730102-1			A				3/29/76	PANEL F6
				E				64	
				C					

⊗ = ME 452 - 0107  
⊗ = ME 452 - 0061

PANEL FG SIMULATOR SMS PAGE 3 OF 7

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION SPEC. NO.	SPD P/N	COMMENTS DESCRIPTION
SWITCH- ROTARY	ABORT MODE OFF	MG 452 - 0093-5025	1003512-01	2 POLE, 4 POS
	RTLS			
S.I. (GAB)	AOA			
	ATD			
ANNUNCIATOR (SPECIAL (GAB))	RCS COMMAND (ONE UNIT) ROLL XDS1	⊗ - 1001		SPLIT LENSE L & R
	PITCH XDS2	-		U & D
	YAW XDS3	-		L & R
INDICATOR, EVENT (GAS)	LANDING GEAR LEFT DS2	⊗ -		UP-BP-DN
	NOSE DS1	-		UP-BP-DN
	RIGHT DS3	-		UP-BP-DN
CONTROLLER	ROTATIONAL HAND CONTROLLER	MC615-0043	GFE	

⊗ MC 434-0070

⊗ MC 432-0222

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VL70-7301027	A						5/27/76	PANEL F6
		B							
		C							

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION SPEC. NO.	SPD P/N	COMMENTS DESCRIPTION
INSTRUMENT (7A7)	MPS PRESSURE PC M1	MC432-0232 ↓ -		PC 1, 2 & 3
	ENG MANF M2	↓ -		LO <sub>2</sub> & LH <sub>2</sub>
	ULLAGE M3	↓ -		LO <sub>2</sub> & LH <sub>2</sub>
	↓ HELIUM M4	↓ -		PNEU, 1, 2 & 3
ANNUNCIATOR	MAIN ENGINE STATUS 3 XDS1	MC434-0075 ↓ -		DOUBLE LENSE
	1 XDS2	↓ -		DOUBLE LENSE
	3 XDS3	↓ -		DOUBLE LENSE
	SM ALERT XDS1	ME452-0061 - 1144	1003393-06	SINGLE LENSE
READOUT	EVENT TIME M4	MC456-0053 -0001		
INSTRUMENT	OMS PRESS PC M1	MC432-0232 ↓ -		PC-LEFT & RIGHT
	N <sub>2</sub> He TANK M2	↓ -		N <sub>2</sub> He TANK - LEFT/KIT & RIGHT

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VE-70-730102-1			A				3/27/76	PANEL F7
				B					
				C					

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION SPEC. NO.	SPD P/N	COMMENTS DESCRIPTION
INSTRUMENT (7A5)	ACCELEROMETER M3	MC432-0219	LP 2058917	ACCEL G UNITS
" (7A3)	SPI	MC432-0221	LP 2058905-01	ELEVONS, BODY FLAP, RUDDER, AILERON, & SPEED BRAKE
ANNUNCIATOR (7A2)	CAUTION & WARNING	MC434-0069		40 LIGHT LABELED MATRIX
DU 1 (7A1)	CRT 2 DISPLAY UNIT	MC615-0006		GFE
DU 2 (7A4)	CRT 2 DISPLAY UNIT			GFE
DU 3 (7A6)	CRT 3 DISPLAY UNIT			GFE

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VL70-730102-1			A				3/29/76	PANEL F7
				B					
				C					

## SWITCH LISTINGS

[illegible]

E ME 452 - 0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VL70-730102-1			A				3/29/76	PANEL 17
				B				BY	
				C				APPR.	

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION SPEC. NO.	SPD P/N	COMMENTS DESCRIPTION
SWITCH (8A4)	DATA BUS SELECT 1	ME452- 0093-5025	1003512-01	2 POLES, 4 POS.
ROTARY	2			
52	3			
	4			
INDICATOR EVENT (8A5)	LANDING GEAR LEFT	MC432-0227		DS1
	NOSE	-		DS2
	RIGHT	-		DS3
INSTRUMENT FLIGHT (8A1)	AMI	MC432-0224	205 89 13	
(8A2)	ADI	MC432-0235	582884	GFE
(8A3)	AVVI	MC432-0226	205 89 14-02	
(8A6)	HSI	MC432-0218	205 89 12-01	

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VL70-730102-1			A				3/29/76	PANEL FB
				B				84	
				C					

## SWITCH STINGS

	SWITCH NAME	TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL SPEC. NO.	CORE LOC SPD P/N	SEE SKETCH	NO DI @ THIS POS.	COMMENTS DESCRIPTION
S3	ATT REF (844)	PUSH BUTTON		MC452-0061				SINGLE LENSE
S1	INSTRUMENT POWER	1	ON OFF	6101	1003370-02			ON-ON
S4	AIR DATA SELECT	3	LEFT RIGHT	6103	1003370-01		NAV	ON-OFF-ON
S5	ATTITUDE	3	INRTL REF				LVLH	ON-OFF-ON
S6	ERROR	3	HIGH LOW				MED	ON-OFF-ON
S7	RATE (844)	3	HIGH LOW				MED	ON-OFF-ON
S2	APU (845)	3	1 3				2	ON-OFF-ON
S1	APU (848)	3	FUEL H2O				—	ON-OFF-ON
S1	FLT CNTLR POWER (847)	10	ON # OFF	6252				ON-ON
S2	TRIM RHC	1	ENABLE INHIBIT	6101	1003370-02			ON-ON
S3	PANEL	1	ON OFF	6101	1003370-02			ON-ON

\* = MOM

\*\* = LOCKED POS

[N] = NEUT.

⊗ ME 452-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VL70-730102-1	A						5/29/76	PANEL F8
		B							
		C							

## SWITCH LISTINGS

	SWITCH NAME	TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL SPEC. NO.	CORE LOC SPD P/N	SEE SKETCH	NO DI @ THIS POS	COMMENTS DESCRIPTION
S4	RADAR (8A7) ALTM	1	1	⊗ 6101	1003370-02			ON-ON
			2	—	—			
S3	HSI SELECT (8A5) MODE	3	ENTRY	⊗ 6103	1003370-01		TEAM	ON-OFF-ON
			APPROACH					
S4	SOURCE	3	TACAN				NAV	ON-OFF-ON
			MLS					
S5	SOURCE (8A5)	3	1				2	ON-OFF-ON
			3					
S1	LANDING GEAR ARM	PUSH BUTTON		MC452-004				SINGLE LENSE
				-1146	1003394-6			GUARDED
S2	DN	P- B						SINGLE LENSE
				Y-1145	1003394-05			GUARDED

\* = MOM

⊗ ME452-0102

\*\* = LOCKED POS  
[N] = NEUT

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VL70-730102-1			A				9/29/76	PANEL F8
				B					
				C					

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION SPEC. NO.	SPD P/N	COMMENTS DESCRIPTION
INSTRUMENT (848)	HYDRAULIC PRESSURE M1	MC432-0232		PRESSURE 1, 2 & 3
	QUANTITY M2			QUANTITY 1, 2 & 3
	APU FUEL/H2O QTY M3			QTY 1, 2 & 3
INSTRUMENT (848)	EGT - FUEL PRESS - OIL TEMP M4			
CONTROL	ROTATIONAL HAND CONTROLLER	MC421-0043		GFE

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VL 70-730102-4			A				3/29/76	PANEL F8
				B					
				C					

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION SPEC. NO.	SPD P/N	COMMENTS DESCRIPTION
SWITCH-	AC1 ΦA	ME 452- 0093-5023	1003312-03	2 POLE, 5 POS.
ROTARY	ΦB			S1
	ΦC			
	AC2 ΦA			
	ΦB	SAME SW 9 POS		
	ΦC			
	AC3 ΦA			
	ΦB			
	ΦC			
METER	AC VOLTS	MC432-0257 -0002	2058911-02	90 TO 130 VOLTS MI

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VLT0-730102-1	A		B				3/29/76	PANEL F9
		C							

TYPE OF EQUIPMENT	NAME	DISPOSITION SPEC. NO.	SPD P/N	COMMENTS DESCRIPTION
SWITCH-	LESS 1BC	ME 452-0093-5023	1003312-03	2 POLE, 9 POS.
ROTARY	2CA			S2
	3AB			
	- MAIN A			
	B	SAME 9 POS SW		
	C			
	- FUEL CELL 1			
	2			
	3			
METER	DC VOLTS	MC432-0237	2058911-01	20 TO 45 VOLTS M2
METER	DC AMPS	-0003	2058911-03	0 TO 500 AMPS M3

REF. DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730102-1			A				3/29/16	PANEL F9
			B				ENG	
			C				APPR.	

\* DENOTES MOMENTARY POS  
# DENOTES LIFT-LOCK POS

ME 452-0102-

PANEL L1 A1 SIMULATOR SMS PAGE 1 OF 3

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VL70-730102	1	1	A				3/30/76	PNL LIAI
	3IV73A1A1			B				TF <i>Robert</i>	
				C				APPR. _____	

TYPE OF EQUIPMENT	NAME	DISPOSITION PROC PART NO.	SPD NO.	COMMENTS DESC
10 LT MAT.	SMOKE DET. A CABIN	MC434-0073		FIRE WARNING 10 LIGHT MATRIX
	L FLT DECK			
	AV BA 1			
	2			
	3			
	B			
	R FLT DECK			
	AV BAY 1			
	2			
	3			

REF. VL70-730102 31V73A1A1	DWG. NO.	REV. 1	PAGE 1	REV. A B C	DATE _____ _____ _____	ENG. _____ _____ _____	APPR. _____ _____ _____	REL. DATE 3/30/76	ENG. TF Herbert	APPR. _____	TITLE PNL L1A1
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## SWITCH SETTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	PROC SPEC NO.	SPD PART NO.	SEE SKETCH	NO D.I AT SW POSITION	CHAR.
S1 HUM SEP A	1	ON	6101	1003370-02	LOCAL SW TIP		ON-ON
		OFF	↓	↓			↓
S2 HUM SEP B	1	ON					
		OFF					
S3 H <sub>2</sub> O PUMP LOOP 1	3	A	6103	1003370-01		OFF	ON-OFF-ON
		B					
S4 ↓ ↓ BYPASS MAN	4	INCR *	6105	1003370-04		———	ON*-OFF-ON*
		DECR *					
S5 ↓ ↓ MODE	1	AUTO	6101	1003370-02			ON-ON
		MAN	↓	↓			↓
S6 LOOP 2	1	ON					
		OFF					
S7 ↓ ↓ BYPASS MAN	4	INCR *	6105	1003370-04		———	ON*-OFF-ON*
		DECR *					
S8 ↓ ↓ MODE	1	AUTO	6101	1003370-02			ON-ON
		MAN	↓	↓			↓
S9 AV BAY 1 FAN A	1	ON					
		OFF	↓	↓			↓
S10 ↓ B	1	ON					
		OFF					
S11 CABIN TEMP CNTLR.	3	1	6103	1003370-01		OFF	ON-OFF-ON
		2					

\* DENOTES MOMENTARY SW. POS.

⊗ ME 452-0102-

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		1	1	A				3/30/76	
31V73A1A2				B				TF <i>Went</i>	PNL L1A2
				C				APPR.	

L1 A2

SIMULATOR SMS

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## SWITCHINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	PROC. SPEC. NO.	SPD. PART NO.	SEE SKETCH	NO D.I. AT SW POSITION	CHARACTERISTICS
S12 IMV FAN A	1	ON	6101	1003370-02	160LB SW TYP.		ON-ON
		OFF					
S13 B	1	ON					
		OFF					
S14 C	1	ON					
		OFF					
S15 AV BAY 2 FANA	1	ON					
		OFF					
S16 B	1	ON					
		OFF					
S17 CABIN FAN A	1	ON					
		OFF					
S18 B	1	ON					
		OFF					
S19 AV BAY 3 FAN A	1	ON					
		OFF					
S20 B	1	ON					
		OFF					
S21 RAD CONTROLLER-OUT TEMP 1	1	HI					
		NORM					
S22 LOOP 1	3	AUTO A	6103	1003370-01		OFF	ON-OFF-ON
		AUTO B					

ME-452-0102-

REF. DWG. NO. VL70-730102 31V73A1A2	REV. PAGE 1 1	REV. DATE ENG. APPR. A _____ B _____ C _____	REL. DATE 3/30/76 ENG. <i>TF</i> APPR. _____	TITLE PNL L1A2
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## SWITCH LOGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	PROC SPEC NO.	SPD PART NO.	SEE SKETCH	NO D.I. AT SW POSITION	CHAR.
S23 RAD CONTR. LOOP 2	3	AUTO A	6103*	1003370-01	TOGGLE SW TYP	OFF	ON-OFF-ON
		AUTO B					
S24 FREON PUMP LOOP 1	3	A					
		B					
S25 LOOP 2	3	A					
		B					
S26 FLOW PROP VLV - LOOP 1	4	INTCHGR*	6105*	1003370-04		—	ON* - OFF - ON*
		PAYLOAD HX*					
S27 LOOP 2	4	INTCHGR*				—	
		PAYLOAD*					
S28 H <sub>2</sub> O ALT. PRESS	1	OPEN	6101*	1003370-02			ON-ON
		CLOSE	—	—			
S29 BYP. VLV MAN SEL 1	4	RAD FLOW*	6105*	1003370-04		—	ON* - OFF - ON*
		BYPASS*					
S30 2	4	RAD FLOW*				—	
		BYPASS*					
S31 FLASH EVAP CONTRL PRI A	3	GPC	6103*	1003370-01		OFF	ON-OFF-ON
		ON					
S32 B	3	GPC				OFF	
		ON					
S33 SEC	3	GPC				OFF	
		ON					

\* ME-452-0102-

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	W70-730102	1	1	A				3/30/76	PNL LIA2
	31V73A1A2			B				ENG. TF <i>Robert</i>	
				C				APPR.	

SWITCH TINGS							
SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	PRJ SPEC NO.	SPD PART NO.	SEE SKETCH	NO DI AT SW POSITION	CHARS
S34 HI LOAD EVAP	1	ENABLE OFF	6101	1003370-02	T66LE SW +YP.		ON-ON
S35 BYP VLV MODE 1	1	AUTO MAN					
S36	2	AUTO MAN					
S37 TOPPING EVAP HTR L NOZZLE	3	A AUTO B AUTO	6103	1003370-01		OFF	ON-OFF-ON
S38	3	A AUTO B AUTO				OFF	
S39	3	A AUTO B AUTO				OFF	
S40	3	A AUTO B AUTO				OFF	
S41 HI LOAD DUCT HTR	3	A B				OFF	
S42 NH <sub>3</sub> CONTRL A	12	PRI/GPC SEC ON	6354			OFF <sup>#</sup>	ON-OFF <sup>#</sup> -ON
S43	12	PRI/GPC SEC ON				OFF <sup>#</sup>	

# DENOTES LL. SW. POS. \* ME 452-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VLT0-730102	1	1	A				3/30/76	PNL LIA2
	31V73A1A2			B				ENG. TF	
				C				APPR.	

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	<del>DISPOSITION</del> PROC SPEC NO.	SPD PART NO.	<del>COMMENTS</del>	DESCRIPTION
EVENT IND				3 STATE	
DS1	FLOW PROP VLV	MC 432-0222			ICH-B.P.-PL.
DS2	↓				↓
DS3	RAD CNTLR				RAD-B.P.-BYP
DS4	↓				↓
R1 POT	CABIN TEMP	ME 444-0059-1001			POT

REF. DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102	1	1	A				3/30/76	PNL L1A2
31VT3A1A2			B				ENG. TF Orlant	
			C				APPR.	

SWITCH STINGS							
SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	PROC SPEC NO.	SPD PART NO.	SEE SKETCH	NO DI AT SW POS.	DESC.
S1 CABIN RELIEF A	4	ENABLE *	6105	1003370-04	T666 SW TYP	—	ON* - OFF - ON*
		CLOSE *					
S2 B	4	ENABLE *				—	
		CLOSE *					
S3 CABIN VENT VENT ISOL	4	OPEN *				—	
		CLOSE *					
S4 VENT	4	OPEN *				—	
		CLOSE					
S5 ANTISKID	1	ON	6101	1003370-02			ON-OFF
		OFF	—	—			
S6 NOSE WHEEL STEERING	3	GPC	6103	1003370-01		OFF	ON-OFF ON
		DIRECT					
S7 BODY FLAP	9	UP *				AUTO/OFF	ON* - OFF# - ON*
		DOWD *					
S8 TRIM ROLL	4	L *	6105	1003370-4		—	ON* - OFF - ON
		R *					
S9 PITCH	4	DOWN *				—	
		UP *					
S10 YAW TRIM	4	L *				—	
		R *					

\* DENOTES MOMENTARY SW. POS.

⊗ ME-452-0102-

REF. VLT0-230102 31V73A2A1	DWG. NO.	REV. 1	PAGE 1	REV. A	DATE	ENG.	APPR.	REL. DATE 3/30/76	TITLE PNL L2A1
				B				ENG. JF [Signature]	
				C				APPR.	

## SWITCHINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	PROC SPEC NO.	SPD. PART NO.	SEE SKETCH	NO DI AT SW POS.	DESC.
S11 ATM PRESS CNTLR-O <sub>2</sub> SYS 1 SUPPLY	4	OPEN *	6105	1003370-04	TOGGLE SW TYP.	—	ON*-OFF-ON*
		CLOSE *					
S12	↓ EMER	4	OPEN *			—	
			CLOSE *				
S13	N <sub>2</sub> SYS 1-SPRAY	4	OPEN *			—	
			CLOSE *				
S14	↓ REG INLET	4	OPEN *	↓	↓	—	↓
			CLOSE *				
S15	O <sub>2</sub> XOVER-SYS 1	1	OPEN	6101	1003370-02		ON - OFF
			CLOSE	—	—		
S16	↓ O <sub>2</sub> /N <sub>2</sub> CNTLR-SYS 1 VLV	3	OPEN	6103	1003370-01	AUTO	ON - OFF - ON
			CLOSE				
S17	PPO <sub>2</sub> SNSR/VLV	1	NORM	6101	1003370-02		ON-OFF
			REVERSE	↓	↓		↓
S18	ATM PRESS CNTLR O <sub>2</sub> XOVER SYS 2	1	OPEN	↓	↓		↓
			CLOSE	—	—		
S19	O <sub>2</sub> /N <sub>2</sub> CNTLR/VLV SYS 2	3	OPEN	6103	1003370-01	AUTO	ON-OFF-ON
			CLOSE				
S20	O <sub>2</sub> SYS 2 SUPPLY	4	OPEN *	6105	1003370-04	—	ON*-OFF-ON*
			CLOSE *				

\* DENOTES MOMENTARY SW. POS. ⊗ ME-452-D102-

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		1	1	A				3/30/76	
31V73A2A1				B				TF Herbert	PNL L2L2
				C					

\* Denotes Momentary POS.      ⊗ ME 452-0102-

PANEL L2A1 SIMULATOR SMS PAGE 3 OF 4

TYPE OF EQUIPMENT	NAME	DISPOSITION PROC. SPEC. NO.	SPD. PART NO.	COMMENTS
<u>EVENT IND</u>				<u>TYPE</u> <u>LEGEND</u>
DS 1	CABIN RELIEF A	MC 432-0222-		2 STATE 2A OP-CL
DS 2	↓ B			
DS 3	CABIN VENT VENT ISOL			
DS 4	↓ VENT			
DS 5	ATM PRESS CNTRL O <sub>2</sub> SYS 1 SUPPLY			
DS 6	N <sub>2</sub> ↓			3 STATE 3A OP-B.P.-CL
DS 7	↓ REG INLET			
DS 8	O <sub>2</sub> EMERG ↓			
DS 9	↓ SYS 2 SUPPLY			
DS 10	N <sub>2</sub> ↓			
DS 11	↓ REG. INLET			

REF. DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-73010a	1	1	A				3/30/76	PNL L2A1
31V73A2A1			B				ENG. TF <i>Went</i>	
			C				APPR.	

### MISCELLANEOUS COMPONENTS

[illegible]

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102	31V73A2A2	1	1	A				3/30/76	SBTC
				B				IF <i>Went</i>	L2A2
				C					

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	DOC SPEC NO.	SPD NO.	FEEDER BUS	SEE SKETCH	COMMENTS
H <sub>2</sub> O LOOP 1 PUMP A AC1 ØA	CB 1		MC454-0026	1003396-01		TYP CB POPPABLE	
AC1 ØB	2						
AC1 ØC	3						
PUMP B AC2 ØA	4						
AC2 ØB	5						
AC2 ØC	6						
H <sub>2</sub> O LOOP 2 PUMP AC3 ØA	7						
AC3 ØB	8						

REF. VL70-730102 31V73A4	DWG. NO.	REV. 1	PAGE 2	REV. A	DATE	ENG.	APPR.	REL. DATE 3/30/76	TITLE CB'S PNL L4
				B				ENG. R.F. 76/ant	
				C				APPR.	

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	PAR. NO.	SPD NO.	FEEDER BUS	SEE SKETCH	COM. TS
H <sub>2</sub> O LOOP 2 PUMP AC3 QC	CB 9		MC454-0026	1003396-01		TYP CB POPPABLE	
AVBAY 1 FAN A AC1 QA	10						
AC1 QB	11						
AC1 QC	12						
FAN B AC2 QA	13						
AC2 QB	14						
AC2 QC	15						
AVBAY 3 FAN A AC3 QA	16						

REF. VL70-730102 31V73A4	DWG. NO.	REV. 1 PAGE 2	REV.	DATE	ENG.	APPR.	REL. DATE 3/30/76	CBS	TITLE
			A				ENG. R.F. Nalox	PNL L4	
			B						
			C				APPR.		

CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	MC PART NO.	SPD NO.	FEEDER BUS	SEE SKETCH	COMMENTS
AV BAY 3 FAN A AC3 & B	CB 17		MC 454-0026	1003396-01		CB TYP POPPABLE	
↓ ↓ AC3 & C	18						
FREON LOOP 1 PUMP A AC1 & A	19						
↓ AC1 & B	20						
↓ AC1 & C	21						
PUMP B AC2 & A	22						
↓ AC2 & B	23						
↓ AC2 & C	24						

REF. DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102	1	2	A				3/30/76	CBS
31V73A4			B				ENG. T.E. <i>Robert</i>	PNL L4
			C				APPR. _____	

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	PROC PAR NO.	SPD NO.	FEEDER BUS	SEE SKETCH	COMMENTS
FREON LOOP 2 PUMP A AC3QA	CB 25		MC 454- 0026	1003396-01		CB'S TYP POPPABLE	
↓	AC3QB	26					
↓	AC3QC	27					
UTILITY POWER FL/OGN	28						
↓	A15/OPC	29					
AV BAY 3 FAN B AC1QA	30						
↓	AC1QB	31					
↓	AC1QC	32					

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-230102	31V73A4	1	2	A				3/30/76	CB'S
				B				ENG. T.F. Whitest	PNL L4
				C				APPR.	

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	ROC PART NO.	SPD NO.	FEEDER BUS	SEE SKETCH	COMMENTS
AV BAY 2 FAN A AC2 0A	CB 33		MC454-0026	1003396-01		CB'S TYP POPPABLE	
↓	↓	↓	↓	↓	↓	↓	↓
AC2 0B	34						
↓	↓	↓	↓	↓	↓	↓	↓
AC2 0C	35						
↓	↓	↓	↓	↓	↓	↓	↓
FAN B AC3 0A	36						
↓	↓	↓	↓	↓	↓	↓	↓
AC3 0B	37						
↓	↓	↓	↓	↓	↓	↓	↓
AC3 0C	38						
↓	↓	↓	↓	↓	↓	↓	↓
FREON LOOP 2 PUMP B AC10A	39						
↓	↓	↓	↓	↓	↓	↓	↓
AC10B	40						

REF. VL70-730102 31V73A4	DWG. NO.	REV. 1	PAGE 2	REV. A	DATE	ENG.	APPR.	REL. DATE 3/30/76	TITLE CB'S
				B				ENG. J.F. Heister	PNL L4
				C				APPR.	

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	SPD. NO.	FEEDER BUS	SEE SKETCH	CONTS
REFRIG LOOP 2 PUMP B ACI & C	CB 41		MC 454-0026	1003396-01	CB'S TYP POPPABLE	
REFRIG FLOW PROP 2	42					
SIG COND 2	43					
FLOW PROP 1	44					
SIG COND 1	45					
IMV FAN A ACI & A	46					
ACI & B	47					
ACI & C	48					

REF. DWG. NO. VL70-730102 31V73A4	REV. PAGE 1 1	REV. DATE ENG. APPR. A _____ B _____ C _____	REL. DATE <u>3/30/76</u> ENG. <u>J.F. Gherst</u> APPR. _____	TITLE CB'S PANEL 4
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## CIRCUIT BREAKER LISTING

CIRCUIT - BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	ROD PART NO.	SPD NO.	FEEDER BUS	SEE SKETCH	COUNTS
IMU FAN B	AC2 4A	CB 49	MC 454-0026	1003396-01		CBS TYP POPPABLE	
	AC2 4B	50					
	AC2 4C	51					
FAN C	AC3 4A	52					
	AC3 4B	53					
	AC3 4C	54					
HYD RTY - 1		55					
TACAN 1		56					

REF. VLTU-730102 31V73A4	DWG. NO.	REV. 1	PAGE 2	REV. A	DATE	ENG.	APPR.	REL. DATE 3/30/76	TITLE CBS PANEL 44
				B				ENG. J.F. [Signature]	
				C				APPR.	

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CROC PART NO.	SPD NO.	FEEDER BUS	SEE SKETCH	COUNTS
LG SENS R A AC2QA	CB 57		MC 454 - 0026	1003396-01			
HYD QTY 2 AC2QB	58						
TACAN 2 AC2QC	59						
LG SENS R B AC3QA	60						
HYD QTY 3 AC3QB	61						
TACAN 3 AC3QC	62						
FUEL CELL 1 PUMPS AC1QA	63						
AC1QB	64						

REF. DWG. NO. VL70-730102 31V73A4	REV. PAGE 1 2	REV. DATE A B C	ENG. APPR.	REL. DATE 3/30/76	CBS PNL L4	TITLE
			ENG. <i>R.F. Herbert</i>	APPR.		

**F-2625-4-A**

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	ROC PART NO.	SPD NO.	FEEDER 'BUS	SEE SKETCH	COCK	TS
FUEL CELL 1 PUMPS AC1 QC	CB 65		MC-454- 0026	1003396-01		—		
2 AC2 QA	66							
AC2 QB	67							
AC2 QC	68							
3 AC3 QA	69							
AC3 QB	70							
AC3 QC	71							
HVA. SER. A AC1 QA	72							

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	A.P.R.	REL. DATE	TITLE
V670-230102 31V73A4	1	2		A				3/30/76	CBS
				B				ENG. I.F. Givens	PNL 44
				C				APPR.	

## CIRCUIT BREAKER LISTING

CIRCUIT	BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	ROX PAK. NO.	SPD NO.	FEEDER BUS	SEE SKETCH	NOTES
HVM SEP	A	AC1 $\Phi$ B	CB 73	MC 454-0026	1003396-01		CB TYP POPPABLE	
	↓	AC1 $\Phi$ C	74					
	B	AC2 $\Phi$ A	75					
	↓	AC2 $\Phi$ B	76					
	↓	AC2 $\Phi$ C	77					
SIG COND HVM SEP			78					
↓	IMV FAN		79					
KU BAND A		AC $\Phi$ A	80					

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102	31V73A4	1	2	A				3/30/76	CB's
				B				IF 9/1/76	PNL 44
				C					

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	ROC PART NO.	SPD NO.	FEEDER BUS	SEE SKETCH	COUNTS
KV BAND A AC1 $\phi$ B	CB 81		MAC 454-0026	1003396-01		CB TYP POPPABLE	
↓ AC1 $\phi$ C	82						
B AC2 $\phi$ A	83						
↓ AC2 $\phi$ B	84						
↓ AC2 $\phi$ C	85						
MAIN ENG 1 PWR AC1 $\phi$ A	86						
↓ AC1 $\phi$ B	87						
↓ AC1 $\phi$ C	88						

REF. DWG. NO. VL70-730102 31V73A4	REV. PAGE 1 2	REV. DATE ENG. APPR. A _____ B _____ C _____	REL. DATE 3/30/76 ENG. TF G. H. J. APPR. _____	TITLE CB's PNL L4
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PANEL L4

SIMULATOR SMS

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CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	PART NO.	SPD NO.	FEEDER BUS	SEE SKETCH	CUM S
MAIN ENG 1 PWR AC2QA	CB 89		MC454-0026	1003396-01		CB TYP POPPABLE	
↓	AC2QB	90					
↓	AC2QC	91					
3	AC3QA	92					
↓	AC3QB	93					
↓	AC3QC	94					
H <sub>2</sub> O CNTLR 2		95					
CABIN AIR S/C		96					

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102	31V73A4	1	2	A				3/30/26	CB's
				B				ENG. J.F. [Signature]	PNL L4
				C				APPR.	

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	PROC PART NO.	SPD NO.	FEEDER BUS	SEE SKETCH	COUNTS
CABIN FAN B AC2 $\phi$ A	CB 97		MC 454- 0026	1003396-01		CB TYP POPPABLE	
↓ AC2 $\phi$ B	98						
↓ AC2 $\phi$ C	99						
A AC3 $\phi$ A	100						
↓ AC3 $\phi$ B	101						
↓ AC3 $\phi$ C	102						
LIGHTING ↓ PANEL LIGHTER	103						
↓ OVHD	104						

REF. VL70-730102 31V73A4	DWG. NO.	REV. 1	PAGE 2	REV.	DATE	ENG.	APPR.	REL. DATE 3/30/76	TITLE CB's PNL L4
				A	_____	_____	_____	ENG. TF Herbert	
				B	_____	_____	_____	APPR. _____	
				C	_____	_____	_____		

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	PAR 1 NO.	SPD NO.	FEEDER BUS	SEE SKETCH	TS
LIGHTING	CB		MC 454- 0026	1003396-01		CB TYPE POPPABLE	Deleted DTD.6
ANNUN L/OVHD	106						
PANEL R	107						
							Deleted DTD.6
							Deleted DTD.6
PANEL MS	110						
							Deleted DTD.6
MAIN ENG 3 PWR AC/BA	112						

REF. DWG. NO. VL70-730102 31V73A4	REV. PAGE 1 2	REV. DATE ENG. APPR.	REL. DATE 3/30/76 ENG. JF [Signature] APPR. _____	TITLE CB's PNL L4
A _____	B _____	C _____		

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	OC PART NO.	SPD NO.	FEEDER BUS	SEE SKETCH	CURTS
MAIN ENG 3 PWR AC1 $\phi$ B	CB 113		MC 454- -0026	1003396-01		CB TYP POPPABLE	
↓							
AC1 $\phi$ C	114						
2							
AC2 $\phi$ A	115						
AC2 $\phi$ B	116						
AC2 $\phi$ C	117						
AC3 $\phi$ A	118						
AC3 $\phi$ B	119						
↓							
↓							
↓							
AC3 $\phi$ C	120						

REF. DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102 31V73A4	1	2	A				3/30/76	CB's
			B				ENG. TF 9/6/76	PNL L4
			C				APPR.	

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	ROC PART NO.	SPD NO.	FEEDER BUS	SEE SKETCH	ITS
CABIN T CNTLR 2	CB 121		MC 454- 0026	1003396-01		CB TYP POPPABLE	
AV BAY 2 S/C	122						
CABIN T CNTLR 1	123						
AV BAY 3 S/C	124						
H <sub>2</sub> O CNTLR 1	125						
AV BAY 1 S/C	126						
ANNUN R CTR	127						
NUM FWD	128						

REF. DWG. NO. VL70-730102 31V73A4	REV. 1 PAGE 2	REV. A DATE ENG. APPR.	REL. DATE 3/30/76 ENG. IF <i>Robert</i> APPR.	TITLE CB's PNL L4
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REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730102	31V73A5	1	2	A				3/30/76	PNL L5
				B				TF 016121	
				C					



SWITCH SETTINGS							
SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	PROC. PART NO.	SPD NO.	SEE SKETCH	CENTER POS.	DESC.
S11 PS LIGHTING FLOOD	1	ON OFF	6101 Ⓢ	1003370-02			ON-OFF
S6 PS AUDIO POWER	3	AUD/TONE OFF	6103 Ⓢ	1003370-01		AUD	ON-OFF-DN
S2	3	T/R OFF				RCV	
S3	3	T/R OFF				RCV	
S1	3	T/R OFF				RCV	
S4	3	T/R OFF				RCV	
S5	3	T/R OFF				RCV	
S8	2	PAGE* —	6102	1003370-05			ON*-OFF

\* DENOTES MOM. POS.

Ⓢ ME 452-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70	730102	0	3	A				3/30/76	
	31V739A2			B				ENG. TF Student	L PNL L9
				C				APPR.	

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION- PROC. PART NO.	SPD NO.	COMMENTS- DESC
DIG SW	S9 PS AUDIO VOLUME A/G 1	MC452-0134-		5 sec DIG. SW
	2			
	A/A			
	ICOM 1			
	2			
ROT. SW.	S10	ME452-0093- 5021		3 POS ROT SW
POT	R1	ME444-0059- -1001		10 POS POT
	R2	ME444-0059- -1001		10 POS POT

REF. DWG. NO. VL70-730102 31V739A2	REV. 0 PAGE 3	REV. A B C	DATE	ENG.	APPR.	REL. DATE 3/30/76 ENG. TF Ombert APPR.	TITLE PNL L9
PANEL L9						PAGE 2 OF 2	



SWITCHINGS

[illegible]

⑦ 2. 3. 4. 5. 6. 7. - 0102 -

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-130.0 2		1	2	A				5/29/76	PANEL 01 BOUND
33V 73A:				B				ENG. Joe	
				C				APPR.	

12/12/75

PANEL 01 SIMULATOR .5MS PAGE 1 OF

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION PPN	SPN	COMMENTS
COAS	CREW OPTICAL ALIGNMENT SIGHT	4070-660810		
JACK	J1 COAS			
ANNUNCIATOR	GPR STATUS 5X5 LT FAILED / VOTING	MC454-0020		25 LT MATRIX
ROTARY SW	S2 AIR TEMP	MF452-0043- SD25	1003512-01	4-POS
ROTARY SW	S3 O2 FLOW	↓	↓	4-POS
METER	M1 AIR TEMP H2O PUMP OUT PRESS	MC432-0038-		2 SCALE
METER	M2 FREON FLOW FREON EVAP OUT TEMP	↓		2 SCALE
METER	M3 CABIN DPDT O2 FLOW			2 SCALE
METER	M4 CABIN PRESS H2O	↓		2 SCALE

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REF. VL 70-730,00 33 V 73A1	DWG. NO. 1 2 12/12/15	REV. A B C	DATE _____ _____ _____	ENG. _____ _____ _____	APPR. _____ _____ _____	REL. DATE 3/29/76	ENG. <i>ja</i>	APPR. _____	TITLE PANEL 01 DUND
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ME 45 2-DIC 2 -

PANEL 2 STIMULATOR SPMS PAGE 1 OF 1

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APP.	REL. DATE	TITLE
VL 70-730102		1	2	A				3/29/76	PAPER - 22 OUTD
35V 7342		12/2/75		B				<i>ga</i>	
				C				APPR.	

## SWITCH RINGS

[illegible]

\* MOMENTARY

⑩ ME + S2-O/O2

REF.	DWG. NO.	REV.	PAGE	REF.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730105		1	2	A				3/29/76	PANEL 03 OVHD
33V 73A3		12/12/75		B				Eng. <i>Joe</i>	
				C				APPR. <i>Joe</i>	

TYPE OF EQUIPMENT	NAME	DISPOSITION PPN	SPN	COMMENTS
ROTARY SW S1	RCS OMS PRESS SELECT	ME452-0093- 5081		3-POS
ROTARY SW S2	RCS OMS REPLY QTY SELECT	- 5022		5-POS
METER M1	RCS OMS PRESS LEFT OXID / FUEL	M143: 0032- 0004		2-SCALE
METER M2	RCS OMS PRESS FWD KIT OXID / FUEL	0004		2-SCALE
METER M3	RCS OMS PRESS RIGHT OXID / FUEL	0004		2-SCALE
DIGITAL READOUT M4	RCS OMS REPLY QTY LEFT FWD KIT RIGHT	MC 432-0229		3-dual digit units
DIGITAL READOUT M5	MISSION TIMER DHMS	MC 456-0054 -0001		9 digits
				ORIGINAL PAGE IS OF POOR QUALITY

REF. DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730,02	1	2	A				362/76	PANEL D3 OVHD
33 V 73A3	12/12/75		B				ENG. <i>[Signature]</i>	
			C				APPR. <i>[Signature]</i>	

## SWITCH SETTINGS

SWITCH NAME		TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PPN	CORE LOG. SPN	SEE SKETCH	NO DI AT THIS Position	COMMENTS
1	AA/TR	3	ON OFF	(X) 6103	1003370-02		RCV	"ON-OFF-ON"
2	AG1	3	ON OFF				RCV	
3	AG2	3	ON OFF				RCV	
4	ICOM A	3	ON OFF				RCV	
5	ICOM B	3	ON OFF				RCV	
6	POWER AUDITONE	3	ON OFF				AUD	
7	—							
8	PAGE	2	* ON	(X) 6102	1003370-02		OFF	* ON-OFF
12	TACAN ID-ON	1	ON	(X) 6101	-02		OFF	ON-ON
13	TACAN ID-NO.	3	1 3	(X) 6103	-01		2	ON-OFF-ON

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③ RE 455-0102-

\* MOMENTARY

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-735102		1	2	A				3/29/76	LEFT AUDIO PNL
33V73A5		12/12/75		B				ENG. <i>Geo</i>	PANEL 05 OUND
				C				APPR. <i>✓</i>	

TYPE OF EQUIPMENT	NAME	DISPOSITION-PPN	SPN	COMMENTS
ROTARY POT	R1 VOX SENS	ME 444-0059-		10-POS
ROTARY POT	R2 MASTER VOL	ME 444-0059-		10-POS
ROTARY SW	S9 VDX CONTROL	ME 452-0093-		2-POS
ROTARY SW	S10 AUDIO MODE SELECT	ME 452-0093- 5082		5-POS
DIGITAL SW	S11 VOLUME CHANNEL CONTROL	ME 452-0093-		6-digits

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REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 7D-730,02		1	2	A				3/29/76	PANEL OS OUTD
33 V 73A5			12/21/75	B				ENG. <i>[Signature]</i>	
				C				APPR. _____	

## SWITCH SETTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CANAL PPN	CORE LOG-SPN	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS
1 LT GRESHLD FLOOD-BCT	3	BRIGHT OFF	6103	1003370-01		VARC	"ON-OFF-ON"
2 STAR TRACKER Y	1	OPEN	6101	1003370-02		CLOSE	"ON-ON"
3 STAR TRACKER Z	1	OPEN				CLOSE	
4 STAR TRACKER AVE Y	1	ON				OFF	
5 STAR TRACKER AVE Z	1	ON				OFF	
6							ORIGINAL PAGE IS OF POOR QUALITY
7 UHF XMIT FREQUENCY	1	296.8				259.7	deleted DTD.6 CHANGE DTD.6
8							deleted DTD.6
9 UHF SQUELCH	1	ON				OFF	SEE DTD.6
10 UHF ANTENNA EXT	1	EXT				AIRLOCK	SEE DTD.6

① ME 452-0100 -

REF. Dwg. NO. VL 70-730102 33 V73A6	REV. PAGE 1 2 12/12/75	REV. DATE A B C	ENG. APPR.	REL. DATE 3/29/76 ENG. Jpn. APPR.	TITLE PANEL 06 01HD
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## SWITCH SETTINGS

SWITCH NAME		TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL PPN	CORE LOC. SPN	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS
12	AUX BUS SELECT L/OVD	3	MNA	ⓧ 6103	1003070-01		OFF	"ON-OFF-ON"
			MNB					
13	AUX BUS SELECT R/CTR	3	MNB	ⓧ 6103	-01		OFF	↓
			MNC					
14	LAMP TEST	4	*LKTR	ⓧ 6105	-04			See DTP.6
			*OVHD					*ON-OFF-ON*
15	MASTER TIMING UNIT	3	OSC 1	ⓧ 6103	-01		AUTO	"ON-OFF-ON"
			OSC 2					
16	DISPLAY ELECTRONICS UNIT 1	2	*LOAD	ⓧ 6102	-05		OFF	"ON* - OFF"
17	2	2	*LOAD		-05		OFF	
18	3	2	*LOAD		-05		OFF	
19	4	2	*LOAD		-05		OFF	↓
20	MDM PL1	1	ON	ⓧ 6101	-03		OFF	"ON-ON"
21	MDM FLT CRT ART FA1	1	ON		-02		OFF	
22	" FA2	1	ON		-02		OFF	

\* MONITARY

3-ON-OFF-ON

2- \*ON-OFF-ON

DME 432 102-

4- \*ON-OFF-ON\*

1-ON-ON

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730122		1	2	A				3/29/76	PANEL D6 DVHD
33V72A6		12/12/75		B					
				C					
APPR.									

## SWITCH SETTINGS

	SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	<del>PPN</del>		CORE LOG.	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS
				PPN	SPN				
23	MDM FLT CRT AFT FA3	1	ON	6101	1003370-02			OFF	"DN-ON"
24	" FA4	1	ON					OFF	
25	MDM PL2	1	ON					OFF	
26	MDM FLT CRT AFT FFT	1	ON					OFF	
27	" FF2	1	ON					OFF	
28	" FF3	1	ON					OFF	
29	" FF4	1	ON					OFF	
30	GPC POWER 1	1	ON					OFF	
31	" 2	1	ON					OFF	
32	" 3	1	ON					OFF	
33	" 4	1	ON	↓	↓			OFF	↓

① ME 452-0102-

REF.	DWG. NO.	REV.	PAGE	REV.	LATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-1130102		1	2	A				3/29/76	PANEL 06 OVHD
33 V 73 A 6		12/12/75		B				ENG. <i>Jan</i>	
				C				APPR. _____	

## SWITCHINGS

SWITCH NAME		TYPE SWITCH	SWITCH NOMEN-CLATURE	<del>CHANNEL</del> PPN	CODE LOG. SPN	SEE SKETCH	No DI COMMENTS AT THIS POSITION
34	GPC POWER 6	1	ON	② 6101	1003371-02		OFF "ON-ON"
35	GPC OUTPUT 1	1	NORMAL				TERMINATE
36	" 2	1	NORMAL				TERMINATE
37	" 3	1	NORMAL				TERMINATE
38	" 4	1	NORMAL				TERMINATE
39	" 6	1	NORMAL				TERMINATE
45	IPL SOURCE	3	mmu 1	② -6103	1003370-01		OFF ON-OFF-ON
			mmu 2				
46	GPC MODE 1	11	# RUN				STBY # OFF-ON
			HALT				
47	" 2	11	# RUN				STBY
			HALT				
48	" 3	11	# RUN				STBY
			HALT				
49	" 4	11	# RUN				STBY
			HALT				

# LOCKED

② ME 452-0102 -

REF. DWG. NO. REV. PAGE	REV. DATE ENG. APPR.	REL. DATE	TITLE
VL 70-730102 38V 73A6	1 2 12/12/75	A B C	REL. DATE 3/29/76 ENG. <i>for</i> APPR. _____
			PANEL 06 OVHD



TYPE OF EQUIPMENT	NAME		DISPOSITION PPN	SPN	COMMENTS
EVENT INDICATOR	IS4	GAL POWER OUTPUT 2	MC 432-0222		2-STATE BP
EI	DS 5	3			2-STATE BP
EI	DS 6	4			2-STATE BP
EI	DS 7	5			2-STATE BP
EI	DS 8	INITIAL PROGRAM LOAD 1			3-STATE RUN
EI	DS 9	IPL MODE 2			3-STATE RUN
EI	DS 10	IPL MODE 3			3-STATE RUN
EI	DS 11	IPL MODE 4			3-STATE RUN
EI	DS 12	IPL MODE 5			3-STATE RUN
PUSH BUTTON LT	S40	IPL 1 RUN	ME 452-0061		?
PB LT	S41	IPL 2 RUN			

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OF POOR QUALITY

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-73 D-02		1	2	A				3/29/76	PANEL 06 CONT
33V73A6		12/12/75		B					
				C					

TYPE OF EQUIPMENT	NAME	DISPOSITION PPN	SPN	COMMENTS
TRANSFORMER	T1 LIGHTING OVERHEAD PANEL	MC 446-0034		<del>REF</del> LIGHTING
TRANS.	T2 LEFT CENTER PANEL			<del>REF</del>
TRANS.	T3 LEFT INSTRUMENT			<del>REF</del>
TRANS.	T4 LT GLASSFIELD FLOOD			<del>REF</del>
POTENTIAL SW	S4 UHF MODE SELECT	ME452-0093-5022		S-POS
W-ARMY ANT	S11 ANNUNCIATOR INTENSITY	ME444-0059		LIGHTING
LIGHT	FLOOD LIGHT			
TRANS.	LT CTR FLOOD			NO. NOT ON DWG
SWITCH INDICATING	DS1 STAR TRACKER DOOR 1	MC430-0022		3 STATE - OP
SW	DS2 STAR TRACKER DOOR 2			3 STATE - OP
SW	DS3 GPR POWER OUTPUT 1			2 STATE - OP

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OF POOR QUALITY

REF. DWG. NO. VL 70-150102 33 V 7846	REV. PAGE 1 2 12/2/75	REV. DATE A B C	APPN. ENG. APPR.	REL. DATE 12/2/75	TITLE PAVEL DB DUND
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[illegible]

REF.	DRG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
V-10-100-02		1	2	A				5/29/15	ANSEL 06 OVHD
33 V7340			15/13/15	B				Eng. <i>[Signature]</i>	
				C				APPR. _____	

## SWITCHINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PPA	CORE LOG SPN	SEE SKETCH	NO. DI AT THIS POSITION	COMMENTS
2 TACAN 1 ANT SEL	3	UPPER LOWER	6103	1003370-01		AUTO	"ON-OFF-DN"
4 TACAN 2 ANT SEL	3	UPPER LOWER				AUTO	
6 TACAN 3 ANT SEL	3	UPPER LOWER				AUTO	
10 AFT LEFT RCS HC PRESS A	3	OPEN CLOSE				GPC	
11 HC PRESS B	3	OPEN CLOSE				GPC	
12 V RELIEF ISOLATION	4	*OPEN *CLOSE	6105	1003370-01		GPC	"ON-OFF-DN"
13 AFT RIGHT RCS HC PRESS A	3	OPEN CLOSE	6103	1003370-01		GPC	"ON-OFF-DN"
14 HC PRESS B	3	OPEN CLOSE	6103			GPC	
15 RELIEF ISOLATION	4	*OPEN *CLOSE	6105	1003370-01		GPC	"ON-OFF-DN"
16 AFT LEFT RCS TANK ISOLATION 1/2	3	OPEN CLOSE	6103	1003370-01		GPC	"ON-OFF-DN"
17 A 3/4/5	3	OPEN CLOSE	6103			GPC	

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① ME 452-0103-  
\* MOMENTARY

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730/02 33V73A7		1 12/12/75	2	A B C				3/29/76	PANEL 07 OVHD
						ENG. <i>[Signature]</i>	APPR. <i>[Signature]</i>		

## SWITCHINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PPN	CORE DOC. SPN	SEE SKETCH	NO. OF AT THIS POSITION	COMMENTS
18 AFT LEFT RCS TANK ISOLATION B 3/4/5	3	OPEN CLOSE	④ - 6103	1003370-01		GPC	ON-OFF-DN
19 AFT RIGHT RCS TANK ISOLATION 1/2	3	OPEN CLOSE				GPC	
20 3/4/5 A	3	OPEN CLOSE				GPC	
21 3/4/5 B	3	OPEN CLOSE				GPC	
22 AFT LEFT RCS MANIFOLD ISOLATION 1	3	OPEN CLOSE				GPC	See DTD. 6
23 2	3	OPEN CLOSE				GPC	
24 3	3	OPEN CLOSE				GPC	
25 4	3	OPEN CLOSE				GPC	
26 5	3	OPEN CLOSE				GPC	
27 AFT RIGHT RCS 1	3	OPEN CLOSE				GPC	
28 2	3	OPEN CLOSE				GPC	

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OF POOR QUALITY

DYE 452 0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-1730-00		1	2	A				3/22/70	PANEL C7 OVHD
33V7347		12/12/75		B				ENG. <i>[Signature]</i>	
				C				APPR. _____	

# SWITCHING TINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PPN	CORE S.P.N.	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS
29	3	RIGHT RCS MANIFOLD ISOLATION 3	6103	1003370-01		GPC	ON-OFF-ON
30	4					GPC	
31	5					GPC	
32	3	LEFT RCS CROSSFEED 1/2				GPC	
33	3					GPC	
34	3	MASTER RCS CROSSFEED	6103	1003370-01		OFF	ON-OFF-ON
35	3	RIGHT RCS CROSSFEED 1/2	6103	1002220-0		GPC	ON-OFF-ON
36	3					GPC	

# 2050 - 2050 - 2050

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
58V 7349		1	1	A					PAGE 07 END
		2	1	B					
		3	1	C					

TYPE OF EQUIPMENT	NAME	<del>DISPOSITION</del> PPN	SPN	COMMENTS
ROTARY SW	S1 TACAN 1 MODE SELECT	ME-452-0043-5025	1003512-01	4-POS
ROTARY SW	S3 TACAN 2 MODE SELECT			4-POS
ROTARY SW	S5 TACAN 3 MODE SELECT		Y	4-POS
DIGI-SW	S7 TUNIC CHANNEL	MA-452-0134-0000		4-digits
DIGI-SW	S8 TUN 2 CHANNEL			4-digits
DIGI-SW	S9 TUN 3 CHANNEL			4-digits
EVENT INDICATOR	DS1 AFT LEFT ECS HE OXID	ME-432-0882-		3-STATE CP
EI	DS2 HE FUEL			3-STATE OP
	DS3 RELIEF ISOLATION			2-STATE CL
EI	DS4 AFT RIGHT ECS HE OXID			3-STATE OP
EI	DS5 HE FUEL			3-STATE OP

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OF POOR QUALITY

REF. DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-750	1	2	A				3-1-75	PANEL ON OVHD
32 V 7347	10/2/75		B				ENG. [Signature]	
			C				APPR. [Signature]	

TYPE OF EQUIPMENT	NAME	DISPOSITION PPN	SPN	COMMENTS
EVENT INDICATOR	DS 6 RIGHT AFT RCS RELIEF ISOLATION	ML432-0282-		2-STATE CL
	DS 7 AFT LEFT RCS TANK ISOLATION			3-STATE OP
	DS 8			
	DS 9			
	DS 10 AFT RIGHT RCS TANK ISOLATION			
	DS 11			
	DS 12			
	DS 13 AFT LT RCS MANIFOLD ISOLATION			
	DS 14			
	DS 15			
	DS 16			

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OF POOR QUALITY

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
5317341		1	2	A				3/22/76	PANEL ON CIND
				B				ENG. <i>[Signature]</i>	
				C				APPR. <i>[Signature]</i>	

TYPE OF EQUIPMENT	NAME	DESCRIPTION PPN	SPN	COMMENTS
EVENT INDICATOR	DS 17 AFT LT RCS MANIFOLD ISOLATION 5	MC 432-0222-		3-STATE OP
	DS 18 AFT RT RCS MANIFOLD ISOLATION 1			
	DS 19			
	DS 20			
	DS 21			
	DS 22			
	DS 23 AFT LT RCS CROSSFIELD 1/2			
	DS 24			
	DS 25 AFT RT RCS CROSSFIELD 1/2			
	DS 26			

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OF POOR QUALITY

REF. DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
✓ 33V034	1	2	A				3/27/90	PAIRL 07 DHD
			B				ENG. <i>Jan</i>	
			C				APPR.	

## SWITCHINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PPN	SPN	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS
1 OMS KIT He PRESS VAPOR ISOL. A	3	OPEN	①-6103	1003370-01		GPC	ON-OFF-ON
2	3	CLOSE				GPC	
3 RT GLARESHIELD FLOOD	3	OPEN				VAR	
		CLOSE					
		BRIGHT					
		OFF					
4 KADAR ALTIMETER 1	1	ON	①-6101	1003370-02		OFF	ON-ON
5	1	ON	①-6101			OFF	
6 TANK ISOLATION A	3	OPEN	①-6103	1003370-01		GPC	ON-OFF-ON
		CLOSE					
7	3	OPEN	①-6103			GPC	
		CLOSE					
8 MLS 1	1	ON	①-6101	1003370-02		OFF	ON-ON
9 MLS 2	1	ON				OFF	
10 MLS 3	1	ON				OFF	
12 LEFT OMS He PRESS VAPOR ISOL A	3	OPEN	①-6103	1003370-01		GPC	ON-OFF-ON
		CLOSE					

① ON-OFF-ON  
② ON-OFF-ON

REF. VLM-000003 32178AB	DWG. NO.	REV. 1 12/12/95	PAGE 2	REV. A B C	DATE	ENG.	APPR.	REL. DATE 3/29/90 ENG. <i>[Signature]</i> APPR.	TITLE PANEL 08 DVHD
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## SWITCH SETTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PPN	CORE LOG. SPN	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS
13 LEFT OMS HE PRESS VAPOR ISOL	3	OPEN	8-103	1003370-01		GPC	ON-OFF-DN
		CLOSE					
14 RIGHT OMS	3	OPEN				GPC	
		CLOSE					
15	3	OPEN				GPC	
		CLOSE					
16 FWD RES HE PRESS	3	OPEN				GPC	
		CLOSE					
17	3	OPEN				GPC	
		CLOSE					
18 ANNUNCIATOR LAMP TEST	4	AL/CTR	8-105	1003370-04			ON-OFF-DN
		TR/OVHD					
19 LEFT OMS TANK ISOLATION A	3	OPEN	8-103	1003370-01		GPC	ON-OFF-DN
		CLOSE					
20	3	OPEN				GPC	
		CLOSE					
21 RIGHT OMS A	3	OPEN				GPC	
		CLOSE					
22	3	OPEN				GPC	
		CLOSE					
23 FWD RES TANK ISOLATION 1/2	3	OPEN				GPC	
		CLOSE					

8-103 458-0000  
\* MON C/TARY

REF. DWG. NO. VL 40-13010 2 33 V 13A 8	REV. 1 12/12/75	PAGE 2	REV. A B C	DATE	ENG.	APPR.	REL. DATE 3/22/76 ENG. <i>gpa</i> APPR.	TITLE PANEL 08 OUND
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## SWITCHES

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PAN	CODE LOG. SPIN	SEE SKETCH	NO. DI AT THIS POSITION	COMMENTS
24 FWD RCS TANK ISOLATION 3/4/5	3	OPEN CLOSE	(X) 6103	1003370-01		GPC	"ON-OFF-ON"
25 RELIEF ISOLATION	4	* OPEN * CLOSE	(X) 6105	1003370-04			"ON*-OFF-ON"
26 LEFT OMS CROSSFEED A	3	OPEN CLOSE	(X) 6103	1003370-01		GPC	"ON-OFF-ON"
27 B	3	OPEN CLOSE				GPC	
28 RIGHT OMS CROSSFEED A	3	OPEN CLOSE				GPC	
29 B	3	OPEN CLOSE				GPC	
30 FWD RCS MANIFOLD ISOLATION 1	3	OPEN CLOSE				GPC	
31 2	3	OPEN CLOSE				GPC	
32 3	3	OPEN CLOSE				GPC	
33 4	3	OPEN CLOSE				GPC	
34 5	3	OPEN CLOSE				GPC	

(X) ME 452-0102 -  
2 MOMENTARY

REF. DWG. NO.	REV. PAGE	REV. DATE	ENG.	APPR.	REL. DATE 3/29/76	PANEL OR TITLE OVHD
VL 70-230102	1 2					
33V73A0	12/12/75				ENG. JJA	
					APPR.	

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION PPN	SPN	COMMENTS
FLOOD LIGHT	FLOOD LIGHT			
TRANSFORMER	RIGHT UTR FLOOD			NE, NOT ON DWG LIGHT
TELEVIS.	NUMERIC LIGHTING	M2 445-0034- 5001		LIGHTING COATED - ( )
	RIGHT PANEL LTG			
	RIGHT INSTRUMENT LTG			
	OVER INSTRUMENT LTG			
RHEOSTAT	RIGHT GLARE-FIELD FLOOD LTG	M2 444-0059		
DIGI-SW	MLS CHANNEL SELECT	M2 452-0134- 0004		3-digits
EVENT INDICATION	OMS KIT TANK INDICATION A	M2 492-0000		3-STATE OP
ET	B			
ET	FWD RCS HE OXID			

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REF. DWG. NO. VL 70-730102 23V73A9	REV. PAGE 1 2 12/13/75	REV. DATE A B C	ENG. APPR.	REL. DATE 3/29/76 ENG. <i>[Signature]</i> APPR. _____	TITLE PANEL 08 OVHD
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## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION PPN	SPN	COMMENTS
EVENT INDICATOR	DS 4 FWD EOS HE FUEL	MC 438-0020		3 STATE-OP
	DS 5 LEFT OMS TANK ISOLATION A			OP
	DS 6			OP
	DS 7 RIGHT OMS			OP
	DS 8			OP
	DS 9 FWD RES 1/2			OP
	DS 10			OP
	DS 11 FWD RES RELIEF ISOLATION			2-STATE 2L
	DS 12 LEFT OMS CROSSFIELD A			3-STATE OP
	DS 13			OP
	DS 14 ET OMS			OP

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OF POOR QUALITY

REF. DWG. NO. VL 70-1730, 10 33V93A8	REV. PAGE 1 2 12/12/15	REV. DATE A B C	ENG. APPR.	REL. DATE 3/29/26 ENG. <i>Jan</i> APPR.	TITLE RAVEL OS DVD
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OF POOR QUALITY

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-73010A		1	2	A				3/29/76	PANEL 08 COND
33V 73AB		12/12/75		B				<i>[Signature]</i>	
				C					

PANEL 08

SIMULATOR SWS

PAGE 3 OF

## SWITCHINGS

SWITCH NAME		TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PPN	GEORGE LEE. SPN	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS
1	AA	3	TR OFF	(X)-6103	1003370-01		RCV	"ON-OFF-ON"
2	AG 1	3	TR OFF				RCV	
3	AG 2	3	TR OFF				RCV	
4	ICOM A	3	TR OFF				RCV	
5	ICOM B	3	TR OFF				RCV	
6	POWER	3	AUD/TONE OFF	↓	↓		AUD	↓
8	PAGE	1	ON	(X)-6101	1003370-02		OFF	"ON-ON"

(X) ME 452-0102-

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730102		1	2	A				3/29/70	RIGHT AUDIO
33V73A9		12/12/75		B					PANEL
				C					C9 OVHD

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION PPN	SPN	COMMENTS
BATTERY POT	R1	ME 444-0059-		11-POS
BATTERY POT	R2	ME 444-0059-		10-POS
DIGI-SW	S4	ME 452-0048-		6-DIGITS
ROTARY SW	S10	ME 452-0043-		2-POS
ROTARY SW	S11	ME 452-0043-		5-POS

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OF POOR QUALITY

REF. DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
1-10-130102	1	12/12/05	A				3/22/16	RIGHT AUDIO
33V13A9			B				ENG. [Signature]	09 QTHD PANEL
			C				APPR. [Signature]	

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	PPN	SPN	FEEDER BUS	SEE SKETCH	Comments
ESS IBC C/WA	1		MC454-0020	1003376-01			
MVA CONTR	2						
ACI SNSR	3						
MTU A	4						
FLOOD LT GLARESHIELD	5						
LDG GEAR ARM DN RESET	6						
CRYO CNTLR O <sub>2</sub> TK2	7						
✓ CRYO CNTLR H <sub>2</sub> TK2	8		✓	✓		✓	

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		1	2	A				3/29/76	PANEL 013 OUND
33V73A13		12/12/75		B				ENG. <i>Jan</i>	
				C				APPR.	

PANEL 012

SIMULATOR SMS

PAGE 1 OF

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	QTY	QORE POS. SPN	FEEDER BUS	SEE SKETCH	CON ITS
ESS 2 CA C/W B	9		12454-0020	1002396-01			
MNB CONTRL	10						
AC 2 SNRSR	11						
MTU B	12						
FLOOD RT GLARESHIELD	13						
CRYO CNTLR O <sub>2</sub> TK1	14						
CRYO CNTLR H <sub>2</sub> TK1	15						
ESS 3AB MNC CONTR	16						

REF. DWG. NO. V-40-730120 33173A13	REV. PAGE 1 2	REV. DATE A B C	ENG. _____ _____ _____	APPR. _____ _____ _____	REL. DATE 3/29/76 ENG. <i>[Signature]</i> APPR. _____	TITLE PANEL 013 OVRD
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## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CIRCUIT PPN	CORE SPN	FEEDER BUS	SEE SKETCH	CORRECTION
ESS 3AB AC 3 SNSR	17		MC-54-0026	1003916-01			
GPC STATUS	18						
FLOOD OOS	19						
ESS 1 BC Cryo QTY O <sub>2</sub> TK <sub>2</sub>	?						Per DTD.6 NO. NOT ON DW
ESS 1 BC Cryo QTY H <sub>2</sub> TK <sub>2</sub>	?						Per DTD.6
ESS 2CA Cryo QTY O <sub>2</sub> TK <sub>1</sub>	?						Per DTD.6
ESS 2CA Cryo QTY H <sub>2</sub> TK <sub>1</sub>	?						Per DTD.6
			↓	↓		?	

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-760102		1	2	A				3/29/76	PANEL 013 OWH
33V73A13		12/12/75		B					
				C					

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	GR PPN	CORE SPN	FEEDER BUS	SEE SKETCH	COMMENTS
MNA OPERATIONAL INST SIG COND[R]HYD SW VLV	1		MC 434-0020	1003376-01			
OF 1/4 A	2						
ON 1/2 A	3						
MDM OF 1/2 A	4						
MDM OF 3/4 A	5						
MNA CRYO O <sub>2</sub> HTE TKI SNSR I	6						
SMOKE DETECTION LR FLT DK	7						
BAY 2A 3B	8						

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL7D-730102		1	2	A				3/29/70	PANEL 014 OVHD
33V73A14		12/12/75		B					
				C					

PANEL 014

SIMULATOR SMS

PAGE 1 OF

## CIRCUIT BREAKER LISTING

CIRCUIT	BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	PPN	SPN	FEEDER BUS	SEE SKETCH	COMMENTS
MNA	FIRE SUPPR BAY 3	9		MC45-0096	1003396-01			
	UTILITY POWER 019 OGN	10						
	FLOOD LEFT CNSE	11						
	MISSION TIMER FWD	12						
	EVENT TIMER AFT	13						
	FREON RAD CNTLR 1	14						
	RAD. CNTLR 2	15						
↓	↓ BYPASS VLV 1	16		↓	↓			

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		1	2	A				3/29/76	PANEL 014 DVHD
33V73A14		12/12/75		B					
				C					

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CH. REL. PPN	SPN SUG.	FEEDER BUS	SEE SKETCH	CO. NTS
MN A FREON BYPASS VLV 2	17		ML454-0026	1003396-01			
ATM PRESS CONTROL N <sub>2</sub> SUPPLY 1	18						
O <sub>2</sub> N <sub>2</sub> CNTLR 1	19						
O <sub>2</sub> KOV R	20						
N <sub>2</sub> REG INLET 1	21						
↓ CABIN VENT	22						
NOSE WHEEL STEERING	23						
↓ RADAR ALTM	24						

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VLTD-730100		1	2	A				5/29/76	PANEL 014 OVHD
33473614		12/10/95		B					
				C					

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	PPN	SPN	FEEDER BUS	SEE SKETCH	COMMENTS
MN A							
MLS 1	25		MC 454-0026	1002396-01			
ADTA 1	26						
STAR TRKR - Z	27						
ACCEL 1	28						
MMU 1	29						
DDU LEFT	30						
DDU AFT	31						
INST LTG L CTR	32						

REF. DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 10-13010	1	1	A				2/29/70	PANEL 014 OUTD
33 V53A14	12/2/75		B				ENG. <i>[Signature]</i>	
			C				APPR. <i>[Signature]</i>	

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CIRCUIT PPN	CORE LOG. SPN	FEEDER BUS	SEE SKETCH	COMMENTS
MNA ANNUN LAMP TEST	33		MC454-0026	1002396-01			See DTD.6?
MNA FWD ———	?		↓	↓			Per DTD.6

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 72-3022		1	2	A				3/29/76	PANEL 014 OVHD
33V73A14		12/2/75		B				ENG. <i>[Signature]</i>	
				C				APPR. <i>[Signature]</i>	

## SWITCHINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	SWITCH PPN	CORE LOG. SPN	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS
1 BRAKES MNA	1	ON	⊗-6101	1003270-02		OFF	"ON-ON"
2 RGA 1	1	ON				OFF	
3 RJDA 1A LOGIC	1	ON				OFF	
4 MANF L2 R2	1	ON				OFF	
5 RJDA 2B LOGIC	1	ON				OFF	
6 MANF L4 R4	1	ON				OFF	
7 RJDF 1A LOGIC	1	ON				OFF	
8 MANF F1	1	ON				OFF	
9 L OMS ENG VLV	1	ON				OFF	
10 ASA 1	1	ON				OFF	
11 IMW 1	1	ON				OFF	See JTD.6

⊗ ME 452-0102-

REF. DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730102	1	2	A				3/29/76	PANEL 014 DUND
33V 73A14	12/13/75		B				ENG. <i>ga</i>	
			C				APPR. _____	

D - ME 452 - 0102 -

PANEL 014 SIMULATOR USNS PAGE 2 OF 2

# CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CHANNEL PPN	CORE SPN	FEEDER BUS	SEE SKETCH	COMMENTS
MN 13 OPERATIONAL INST SIG COND R [HYD SW VLY	1		ML 454-0026	1003396-01			
OF 1/4 B	2						
OF 2/3 A	3						
Om 1/2 B	4						
MDM OF 1/2 B	5						
CRYO O2 HTR TK2 SNKR 2	6						
SMOKE DETN BAY 18 3A	7						
FIRE SUPPR BAY 1	8						

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-93002	33V 75A15	1	2	A				3/6/72	PANEL DIS DUHD
		12/2/95		B				ENG. <i>[Signature]</i>	
				C				APPR. <i>[Signature]</i>	

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CHASSIS PPN	CORE SPN	FEEDER BUS	SEE SKETCH	
MNB UTILITY PWR FI DPC	9		MC 454-0026	1003396-01			
FLOOD RIGHT CNCL	10						
FLOOD LEFT CTR	11						
MISSION TIMER AFT	12						
EVENT TIMER FWD	13						
FREON RAD CNTLR 1	14						
FREON RAD CNTLR 2	15						
✓ CABIN DP DT	16		✓	✓		✓	

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-130102		1	2	A				3/29/76	PANEL DIS OVHD
33V73A15		12/2/75		B					
				C					

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	PPN	CORE LBE. SPN	FEEDER BUS	SEE SKETCH	CONNECTION
MINIB ATM PRESS CONTROL 1/2 SUPPLY 2	17		MC 454-0026	1003346-01			
G2N2 CNTLR 2	18						
O2 XOVE 2	19						
N2 REG INLET 2	20						
CABIN VENT ISOL	21						
CABIN RELIEF A	22						
HEADAR ALTM 2	23						
MLS 2	24						

REF. DWG. NO.	REV. PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
V-70-130-02 33V73A15	1 2 10/12/95	A B C				3/29/76	PANEL O/S DUHD
				ENG. <i>[Signature]</i>	APPR. <i>[Signature]</i>		



REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
1	1476-730128	A	2					3/29/76	PANEL OIS OVHD
2	33V13415	B							
		C							

# SWITCHINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PPN	CORE POS-SPN	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS
BRKES MNB	1	ON	1003370-02			OFF	"DN-DN"
RGA 2	1	ON				OFF	
RJDA 1B LOGIC	1	ON				OFF	
MANE LI LS/R1	1	ON				OFF	
RJDF 2B LOGIC	1	ON				OFF	
MANE F2	1	ON				OFF	
ASA 2	1	ON				OFF	
IMU 2	1	ON				OFF	
F22 CNTLR	1	ON				OFF	SEE 272.6 SS & S6 deleted

ME 452-002-

REV. PAGE  
1 2  
10/10/75

REV. A  
B  
C

DATE

ENG.

APPR.

REL. DATE 3/29/76

ENG. Jm

APPR.

TITLE  
PANEL 015 OUTH

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CHG. PPN	SPN	FEEDER BUS	SEE SKETCH	COMMENTS
MNC							
OPERATIONAL INST SIG COND R HYD SW VLV	1			ME 454-0026 1003396-01			
SIG COND R OF 2/3 B	2						
NDM OF 2/4 B	3						
CRYO O <sub>2</sub> HTR TK1 SNSR 2	4						
CRYO O <sub>2</sub> HTR TK2 SNSR 1	5						
SMOKE DETN CABIN	6						
SMOKE DETN BAY 1A 2B	7						
FIRE SUPPR BAY 2	8						

REF. DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-780102	1	2	A				3/29/76	PANEL 016 OVRD
331 12/10/75	B		B				ENG. <i>[Signature]</i>	
	C		C				APPR. <i>[Signature]</i>	

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CHAS. PPN	GORE LOC. SPN	FEEDER BUS	SEE SKETCH	COMMENTS
UTILITY POWER ALL AIS OEH	9		m3434-0026	1003396-D1			
FLOOD RIGHT CTR	10						
FREON RAD CNTRL 1	11						
RAD CNTRL 2	12						
By PASS VLV 1	13						
By PASS VLV 2	14						
H <sub>2</sub> O ALT PRESS	15						
ATM PRESS CONTR O <sub>2</sub> EMER	16						

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VLTD-030102		1	2	A				3/29/76	PANEL 016 OUTH
33VT3910		12/16/75		B					
				C					

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CHAM PPN	CODE SPN	FEEDER BUS	SEE SKETCH	COMMENTS
MNC ATM PRESS CONTR CABIN RELIEF B	17		MC454-DD26	1003396-01			
MLS 3	18						
ADTA 3	19						
ADTA 4	20						
ACCEL 3	21						
DDU RIGHT	22						
DDU AFT	23						
RES OMS PRFLT QTY GAUGE	24		✓	✓			

REF. DWG. NO. REV. PAGE	REV. DATE ENG. APPR.	REL. DATE	TITLE
12-10-130102 33473010	A B C	3/29/76	PANEL 06 OVHD
12/12/75		ENG. <i>ja</i>	
		APPR. _____	

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	PPN	CORE LOC. SPN	FEEDER BUS	SEE SKETCH	COMMENTS
MNC FWD —			MC454- 0026	1003396-01			Per DTD.6
MNC AFT —							Per DTD.6

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
V-70-730102		1	2	A				5/21/76	PANEL 016 OVHD
33V73016				B					
				C					

## SWITCHINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PPN	CORE LOG. SPN	SEE SKETCH	No DI AT THIS POSITION	COMMENTS
1 BRAKES MNC	1	ON	①-6101	1003370-02		OFF	"ON-ON"
2 RGA 3	1	ON				OFF	
3 RJDA 2A LOGIC	1	ON				OFF	
4 MANE L3 R3/R5	1	ON				OFF	PER DTD. 12
5 RJDF 1B LOGIC	1	ON				OFF	
6 F3	1	ON				OFF	PER DTD. 6
8 RJDF 2A LOGIC	1	ON				OFF	
9 MANE F4/F5	1	ON				OFF	
7 R OMS ENG VLV	3	ON OFF	①-6103	1003370-01		—	"ON-OFF-ON"
10 IMU 3	1	ON	①-6101	1003370-02		OFF	"ON-ON"
11 FL3 CNTLR	1	ON				OFF	

① ME458-0102-

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
1200-73012		1	2	A				3/27/70	PANEL 016 OUND
33073410		12/21/75		B					
				C					

PANEL 016

SIMULATOR 7015

PAGE 1 OF

## SWITCHINGS

[illegible]

⑧ ME 452-0102-

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-73002		1	2	A				3/29/76	PAGE - 010 OUT
33V75916		12/10/75		B				ENG. <i>[Signature]</i>	
				C				APPR. _____	

## SWITCH SETTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL PPN	CORE LOG. S.P.N.	SEE SKETCH	NO DI AT THIS POSITION	REMARKS
1 ATVC	1	ON	246101	1003370-03		OFF	"ON-ON"
2	1	ON				OFF	
3	1	ON				OFF	
4	1	ON				OFF	
5 REC 1	1	ON				OFF	
6 REC 2	1	ON				OFF	
7 EIU 1	1	ON				ON	
8	1	ON				ON	
9	1	ON				ON	
10 SIGNAL CONDITIONER FREON A	3	AC2 AC3	246103	1003370-01		OFF	"ON-OFF-ON"
11 FREON B	3	AC2 AC3				OFF	

(X) ME 452-0103-

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
UL 70-730100		1	2	A				3/29/75	PANEL 017 DUND
33V 73A7			12/12/75	B				ENG. <i>[Signature]</i>	
				C				APPR. <i>[Signature]</i>	

① ME 452-0102-

PANEL 07 SIMULATOR SMC PAGE 3 OF





## SWITCH SETTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL SPEC NO	CORE LOG SPL PART NO	SEE SKETCH	NO DI at This Location	COMMENTS DESCRIPTION
<u>Control Bus Pwr</u>		*Reset	⊗-6102	1003370-05			*ON-ON
MNA	2	-	-	-			
MNB	2	*Reset	-	-			
MNC	2	*Reset	-	-			
<u>ESS Bus Source</u>		ON	⊗-6101	1003370-02			ON-ON
MNB/C	1	OFF	-	-			
MNC/A	1	ON	-	-			
MNA/B	1	OFF	-	-			
FC1	1	ON	-	-			
FC2	1	OFF	-	-			
FC3	1	ON	-	-			
<u>FC1 Main Bus</u>		* ON	⊗-			#[N]	*ON-*OFF-*ON
A	9	* OFF					
B	9	* ON				#[N]	
		* OFF					

\* = mem

⊗ = Locked pos

[N] = No

⊗ ME452-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730102		1	1	A				3/26/76	PANEL
32V73A1A1		12-12-75		B				TRW Linker	R1A1
				C					1 of 7

## SWITCH LISTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL SPEC NO.	CORE LOC. SPD Part NO	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS
FC/Main BUS		* ON	⑧			# [N]	* ON - OFF - ON
C	9	* OFF					
MN BUS TIE		* ON	⑧-6105	1003370-041		[N]	* ON - OFF - ON
A	4	* OFF					
B	4	* ON				[N]	
		* OFF					
C	4	* ON				[N]	
		* OFF					
INV PWR		* ON				[N]	
1	4	* OFF				[N]	
2	4	* ON				[N]	
3	4	* OFF				[N]	
INV/AC BUS		* ON				[N]	
1	4	* OFF				[N]	
2	4	* ON				[N]	
3	4	* OFF				[N]	

\* = Power

# = Loc. Ref. No.

[N] = Null

⑧ = ME 450-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	PANEL	TITLE
V170-730102		1	1	A				3/20/74	R1A1	
32 V73 R1A1	12-12-75			B				ENG. <u>Thomson</u>		
				C				APPR. _____		207

## SWITCH LISTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL SPEC NO	CORE LOC. SPD PART NO	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS DESCRIPTION
AC BUS SNR	3	Auto Trip	6103	1003370-01		OFF	ON - OFF - ON
1		Monitor					
2	3	Auto Trip				OFF	
		Monitor					
3	3	Auto Trip				OFF	
		Monitor					
Payload	3	MNB				OFF	
		MNC					
Cabin							
PRI	1	ON	6101	1003370-02			ON - ON
MNB		OFF					
PRI	1	ON					
FC3		OFF					
PRI	1	ON					
MNC		OFF					
AUX	3	ON	6103	1003370-01		[N]	ON - OFF - ON
		OFF					
AFT	1	ON	6101	1003370-02			ON - ON
MNB		OFF					
AFT	1	ON					
MNC		OFF					

[N] = null (\*) = ME 452 - 0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730102		3	1	A				3/26/76	PANEL
32V73 A1A1	12-12-75	B		B				ENG. M. G. Bink	: R1A1
		C		C				APPR.	3 OF 7

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CHANNEL SPEC NO.	CORE LOG SPN PART NO.	FEEDER BUS	SEE SKETCH	COMMENTS
AC CONTR							
AC 1	1		ML 454-0036	1003394-01			
Φ A			-				
Φ B	2		-				
Φ C	3		-				
AC 2							
Φ A	4		-				
Φ B	5		-				
Φ C	6		-				
AC 3							
Φ A	7		-				
Φ B	8		-				

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
								3/26/76	PH/EL
								ENG. <u>Mr. Bunker</u>	R. I. A. I.
								APPR. _____	



MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION SPEC NO	SPD PART NO	COMMENTS	DESCRIPTION
EVEN INDICATORS	POWER DISTRIBUTION FC MAIN BUS	MC432-0222			2 STATE CN - OFF
	A				
	B				
	C				
	MN BUS TIE				
	A				
	B				
	C				
	INV PWR				
	A				
	B				
	C				
	INV / AC BUS				
	A				
	B				

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-73 010 2		I	2	A				3/24/76	PANEL
32V 73 A1 A1		12-12-75		B				ENG. <i>M. A. Gindler</i>	RIA1
				C				APPR.	

[illegible]

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		2	2	A				3/26/76	PANEL
				B				ENG. <u>M. W. Ginder</u>	RIA1
30-73 A1 A1		12-12-75		C				APPR. _____	

## SWITCH LISTINGS

SWITCH NAME		TYPE SWITCH	SWITCH NOMEN-CLATURE	PROC. SPEC. Part No	SINGER PART NO.	SEE SKETCH	NO DI at this position	COMMENTS Description
S2	CRYO O <sub>2</sub> Manifold VLV Tank 2	4	* open	⊗-6105	1603370-04		[N]	*DN-OFF-*ON
			* close					
S5	Tank 2	4	* open				[N]	
			* close					
S3	H <sub>2</sub> Manifold VLV Tank 2	4	* open				[N]	
			* close					
S6	Tank 2	4	* open				[N]	
			* close					
S1	Fuel Cell 2 Reac	4	* open				[N]	
			* close					
S4	Fuel Cell 2 Reac	4	* open				[N]	
			* close					
S7	Fuel Cell 3 Reac	4	* open				[N]	
			* close					
S11	H <sub>2</sub> TK 2 Heaters Auto	3	A	⊗-6103	1003370-01		OFF	ON - OFF - ON
			on					
S12	Auto	3	B				OFF	
			on					
S19	H <sub>2</sub> TK 2 Heaters Auto	3	A				OFF	
			on					
S20	Auto	3	B				OFF	
			ON					

\* = norm  
[N] = null

⊗ = ME 452-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		1	1	A				3/26/76	PANEL
32V73 A1A2				B				ENG. T. W. Sinker	RIA2
				C					10F4

SWITCH SETTINGS									
SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL SPEC NO	CORE SPD #1 NO	SEE SKETCH	NO DIS AT THIS POSITION	COMMENTS		
S8 CRYO 02 TK 1 Heaters Auto	3	A	6-6103	1003370-01		OFF	ON - OFF - ON		
		ON							
		B				OFF			
		ON							
S9 Auto	3	* Reset	6-6105	1003370-04		OFF	* ON - OFF - ON		
		* Test							
S10 02 TK 2 Heaters Auto	3	A	6-6103	1003370-01		OFF	ON - OFF - ON		
		ON							
		B				OFF			
		ON							
S11 Auto	3	* Reset	6-6105	1003370-01		OFF	* ON - OFF - ON		
		* Test							
		* Start				# [N]	* ON - # OFF - ON		
		* Stop				# [N]			
S12 Fuel cell 1	9	* Start				# [N]			
		* Stop							
		* Start							
		* Stop							
S13 2	9	* Start							
		* Stop							
		* Start							
		* Stop							
S14 3	9	* Start							
		* Stop							
		* Start							
		* Stop							

X = Move  
F = Lock position  
N = Null

REF. VLT0-730102  
32073 A1A2

DWG. NO. 2  
12-12-75

PAGE 2

REV. 1  
12-12-75

DATE 3/24/76

REL. DATE 3/24/76

APPR.

ENG. Mowbray

APPR.

TITLE PANEL R1A2

PANEL R1A2

SIMULATOR

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TYPE OF EQUIPMENT	NAME	DISPOSITION		COMMENTS	
		SPEC NO	SPD PART NO	DESCRIPTION	
EVENT DS3 INDICATORS	CRYO O <sub>2</sub> MANIFOLD VLV TANK 1	MC432-0222		2 STATE OPEN-CLOSE	
DS7	TANK 2				
DS1	FUEL CELL				
DS2	1 REAC O <sub>2</sub>				
DS5	H <sub>2</sub>				
DS6	2 REAC O <sub>2</sub>				
DS9	H <sub>2</sub>				
DS10	3 REAC O <sub>2</sub>				
DS4	H <sub>2</sub> MANIFOLD VLV TANK 1				
DS8	TANK 2				

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
V70-730102		1	1	A				3/26/76	PANEL
32 V73A1A2		12-12-75		B				now under	RIA2
				C				APPR.	

PANEL RIA2

SIMULATOR

SMS

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[illegible]

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
V70-730102	7	I	A					3/26/76	PANEL
			B						RIA2
			C						
32073 A1A2	12-12-75								

# SWITCH LISTINGS

SWITCH NAME		TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL SPEC NO	CORE LOC. SPD PART NO	SEE SKETCH	NO DI at this Position	COMMENTS
S1	MPS PRPLT Dump Sequence L02	3	Start	⊗ 6103	1003370-01		GPC	ON - OFF - ON
			Stop					
S2	LH2	3	Start				GPC	
			Stop					
S3	Engine Power 1 AC2	1	ON	⊗ 6101	1003370-02			ON - ON
			OFF	-	-			
S4	2 AC2	1	ON	-	-			
			OFF	-	-			
S5	3 AC3	1	ON	-	-			
			OFF	-	-			
S6	1 AC2	1	ON	-	-			
			OFF	-	-			
S7	2 AC3	1	ON	-	-			
			OFF	-	-			
S8	3 AC1	1	ON					
			OFF					
S9	He Crossover 1	3	Open	⊗ 6103	1003370-01		GND	ON - OFF - ON
			Close					
S10	2	3	Open				GND	
			Close					
S11	3	3	Open				GND	
			Close					

⊗ = ME 452-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-73 0102		2	2	A				3/24/76	PANEL
32V73 A2		12-12-75		B				ENG. <u>max dinkel</u>	R2
				C				APPR. _____	

## SWITCH LISTINGS

SWITCH NAME		TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL SPEC NO	CORE LOG-SPD NO	SEE SKETCH	NOTES AT THIS POSITION	COMMENTS DESCRIPTION
S2	MPS He ISOLATION 1	11	# Oper	(*) -			GND	# ON-OFF-ON
			close					
			# Open				GND	
			close					
S13	2	11	# Oper				GND	
			close					
S14	3	11	# Oper					
			close					
S15	PNEU APU/HYD AFU CONTROL 1	3	Open	(*) - 6103	1003370-01		GND	ON-OFF-ON
			close					
S16	2	3A	# Start Run	(*) - 6353	1003604-02		# OFF	# ON-OFF-ON
			# Stop/Idle/Run					
S17	3	3A	# Start Run				# OFF	
			# Stop/Idle/Run					
S18	3	3A	# Start Run				# OFF	
			# Stop/Idle/Run					
S19	APU speed select 1	1	High	(*) - 6101	1003370-02			ON-ON
			Normal					
S20	2	1	High					
			Normal					
S21	3	1	High					
			Normal					
S22	APU Auto (1-3) Drive	1	High					
			Normal					

$$\# = \text{Loc Rev } 0 \dots 1107$$

④ ME 452-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
V670-730102	I	J		A				3/24/79	PANEL
32073 A2		12-12-75		B				MAGSINUS	A2
				C					
								APPR.	
PANEL R2 :								SMS	PAGE 2 OF 6

## SWITCH LISTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL SPEC NO	CORE LOG: SPD PART NO	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS DESCRIPTION
<u>APU HYD</u>							
<u>Boiler Hyd Bypass</u>	1	Bypass	6-6103	1003370-01		GPC	ON - OFF ON
	3	Norm					
	3	Bypass				GPC	
	3	Norm					
	3	Bypass				GPC	
	3	Norm					
<u>Hyd Main Pump Press</u>							ON - ON
1	1	Norm	6-6101	1003370-02			
		Low					
	1	Norm					
2	1	Low					
		Norm					
	1	Low					
<u>Hyd Circ Pumps</u>							ON - OFF - ON
1	3	on	6103	1003370-01		GPC	
		OFF					
	3	ON				GPC	
2	3	OFF				GPC	
		ON					
	3	OFF					
<u>APU CTR PWR</u>							# ON - ON
1	10	# on	6252				
		OFF					
		# on					
2	10	OFF					

# = Lock position

ME 452-0102

REF. DWG. NO.

VL70-730103

32 V73 A2

REV. PAGE

1 1

12-12-75

REV.

A

B

C

DATE

ENG.

APPR.

REL. DATE 3/24/76

ENG. m.w. Anderson

APPR

TITLE

PANEL

R2

30FG

## SWITCH LISTINGS

SWITCH NAME		TYPE SWITCH	SWITCH NOMEN- CLATURE	SPEC NO	CORE LOC. SPD PART NO	SEE SKETCH	NO DI ATTN'S POSITION	COMMENTS DESCRIPTION
S34	APU/HYD APU CNTRL PWR 3	10	# ON	⊗-6252				# ON - ON
			OFF	-	-			
S35	APU FUEL TK VLV 1	10	# OPEN					
			close	-	-			
S36	2	10	# OPEN					
			close	-	-			
S37	3	10	# OPEN					
			close	→	→			↓
S38	Boiler CNTRL 1	1	ON	⊗-6101	1003370-02			ON - ON
			OFF	-	-			
S39	3	1	ON					
			OFF	-	-			
S40	3	1	ON					
			OFF	→	→			↓
S41	Boiler CNTRL PWR HTR 1	3	A	⊗-6103	1003370-01		OFF	ON - OFF - ON
			B					
S42	2	3	A				OFF	
			B					
S43	3	3	A				OFF	
			B					
				↓	↓			↓

# = LOCKED POSITION

⊗ = ME 452-0103

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	V270-730102	1	1	A				3/26/76	PANEL
	32073 A-2			B				ENG. <u>MAW Dink</u>	R2
		12-12-75		C				APPR	4 OF 6

## SWITCH LISTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL SPEC NO	CORE LOC. SPD PART NO	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS DESCRIPTION
544	1	ON	⊗-6101	1003370-02			ON - ON
		OFF	-	-			
545		ON	-	-			
	1	OFF	-	-			
546	1	ON	-	-			
	1	OFF	-	-			
547	3	GPC	⊗-6103	1003370-01		OFF	ON - OFF - ON
		Man					
548	1	GND	⊗-6101	1003370-02			ON - ON
		STOW	-	-			
549	3	OPEN	⊗-6103	1003370-01		OFF	ON - OFF - O
		close					
550	3	Release				OFF	
		Latch					
551	3	OPEN				OFF	
		close					
552	3	Release				OFF	
		Latch					
	1	Auto	⊗-6101	1003370-01			ON - ON
		DN	-	-			

⊗-ME 452-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VL70-730102	1	2	A				3/26/76	PANEL
	32V73A2			B				max linker	R2
	PANEL R2	12-12-75		C					5 OF 6

TYPE OF EQUIPMENT	NAME	DISPOSITION SPEC NO	SPD PART NO.	COMMENTS DESCRIPTION
EVENT DS1 INDICATORS	ABU/HVJ READY TO START	MC432-0222		2 STATE GRAY - B.P.
DS2	1			
DS3	2			
DS4	3			3 STATE DEPLOY - B.P. - STOW
DS5	ET UMBILICAL DOOR CENTERLINE LATCH LEFT DOOR			OPEN - B.P. - CLOSE
DS6	LATCH RIGHT DOOR			LATCH - B.P. - RELEASE
DS7				OPEN - B.P. - CLOSE
DS8	LATCH			LATCH - B.P. - RELEASE

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
UL70-730102		2	7	A				3/26/76	PANEL
				B				ENG. M. W. Ginder	A2
				C				APPR.	
30073A2		12-12-75							
PANEL A2				SIMULATOR		SMS		PAGE 6 OF 6	

## SWITCH LISTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL SPEC NO	CORE LOG. SPPRAT NO	SEE SKETCH	NOV. ATTN'S POSITION	COMMENTS DESCRIPTION #
MAIN PROPULSION SYSTEM MAN PRESS							
LO <sub>2</sub>	12	OPEN	⑧-6354			# G-PC	ON-OFF-ON
		CLOSE					
		OPEN				# G-PC	
LH <sub>2</sub>	12	CLOSE					ON-ON
ENGINE CNTLA HTR			⑧-6101	1003370-02			
1	1	AUTO					
		OFF					
2	1	AUTO					
		OFF					
3	1	AUTO					
		OFF					
PROPELLANT FILL DRAIN			⑧-6354			# [N]	ON-OFF-ON
LO <sub>2</sub>		OPEN					
OUT CRD	12	CLOSE				# [N]	
		OPEN					
IN BRD	12	CLOSE				# [N]	
LH <sub>2</sub>		OPEN				# [N]	
OUT BRD	12	CLOSE				# [N]	
		OPEN					
IN BRD	12	CLOSE					
		OPEN	⑧-6103	1003370-01		GND	ON-OFF-ON
H <sub>2</sub> PRESS LINE VENT	3	CLOSE					

# = Locked position [N]

⑧ = ME 452-0102

REF. DWG. NO.

REV. 1

PAGE 2

REV. A

REV. B

REV. C

DATE

ENG.

APPR.

REL. DATE 3/26/76

ENG. M. W. Rinder

APPR.

TITLE

PANEL

R. 41

10 F4

## SWITCH LISTINGS

SWITCH NAME		TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL SPEC NO	CORE LOC. SPD PART NO	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS DESCRIPTION
S11	MAIN PROPULSION SYSTEM LO <sub>2</sub> PREVALVE 1	12	OPEN	⊗-6354			# GPC	ON - OFF - ON
			CLOSE					
S12	2	12	OPEN				# GPC	
			CLOSE					
S13	3	12	OPEN				# GPC	
			CLOSE					
S14	LH <sub>2</sub> PREVALVE 1	7A	OPEN	⊗-6258	1003604-03		# GPC	ON - OFF - ON
			* CLOSE					
S15	2	7A	OPEN				# GPC	
			* CLOSE					
S16	3	7A	OPEN				# GPC	
			* CLOSE					
S17	FEED LINE RLF 1506 LO <sub>2</sub>	3	OPEN	⊗-6103	1003370-01		GPC	ON - OFF - ON
			CLOSE					
S18	LH <sub>2</sub>	3	OPEN				GPC	
			CLOSE					
S19	HYDRAULICS LG Heater ACTUATORS	3	AUTO PRI				OFF	
			AUTO SEC					
S20	LINE	3	AUTO A				OFF	
			AUTO B					
S21	LG RETRACT CIRC VLV	12	OPEN	⊗-6354			# GPC	ON - OFF - ON
			CLOSE					

\* = Man

# = Locked Position

⊗ = ME 452-0102

REF.	CHK. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
UL 70-730102		1	2	A				3/26/76	PANEL
32073 AY		12-12-75		B				ENG. <u>MW Under</u>	R4:
				C				APPR. _____	20F4

## SWITCH LISTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL SPEC NO	GORE LOG. PART NO	SEE SKETCH	NO. OF THIS POSITION	COMMENTS DESCRIPTION
HYDRAULICS							
1 LG HYD ISOL VLV	4	* OPEN	(K)-6105	1003370-04		AUTO	* ON - OFF - ON
		* CLOSE					
2	4	* OPEN				AUTO	
		* CLOSE					
3	4	* OPEN				AUTO	
		* CLOSE					
MPS/TVC ISOL VLV							ON - ON
1	1	OPEN	(K)-6101	1003370-02			
		CLOSE					
SYS 1	1	OPEN					
		CLOSE					
SYS 2	1	OPEN					
		CLOSE					
SYS 3	1	OPEN					
		CLOSE					

\* = MCM.

① = ME 452-0107

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
4170-730107		1	2	A				3/26/76	PANEL
3207344				B				ENG. <i>mmw</i>	R4
PANEL R4		12-12-75		C				APPR.	30FY

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME		DISPOSITION		COMMENTS	
	MAIN PROPULSION SYSTEM		SPEC NO		DESCRIPTION	
EVENT INDICATORS	DS1 LG-HYD ISOL VLV		MC432-0222		2 STATE OPEN - CLOSE	
	1		—			
	2					
DS2						
DS3	3					

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-73010		2	2	A				3/24/76	PANEL
33J73A4		12-12-75		B				ENG. <i>mwinder</i>	R4
				C				APPR.	

## SWITCH( STINGS

[illegible]

⑩ ME 452-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
V270-73 0102		2	2	A				3/26/76	PANEL A6
32073 A6		12-12-75		B				M. W. Ainsworth	
				C					

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		2	2	A				3/26/76	PANEL R6
				B				ENG. <i>m.w. White</i>	
32 V.73 A6		12-12-75		C				APPR. _____	

SWITCH SETTINGS

SWITCH NAME		TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL SPEL NO	CORE LOG. SPD PART NO	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS DESCRIPTION
S4	MS AUDIO	3	AUDITONE	⊕-6103	1003370-01		AVD	ON-OFF-ON
	POWER		OFF					
S2	ALG	3	TIR				RCUR	
	1		OFF					
S3	2	3	TIR				RCUR	
			OFF					
S1	NA	3	TIR				RCUR	
			OFF					
S4	ICOM	3	TIR				RCUR	
	1		OFF					
S5	2	3	TIR				RCUR	
			OFF					
S8	PAGE	3	* PAGE	⊕-6102	1003370-05			* ON-ON
			[N]	-	-			
S12	MS LIGHTING FLOOD	1	ON	⊕-6101	1003370-02			ON-ON
			OFF	-	-			

[N] = Null Position

\* = Momentary

⊕ = ME 452-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
V170-730102		0	3	A				3/26/76	PANEL
32073A10A2		12-11-73		B				ENG. <i>max kender</i>	* R10A2
				C				APPR. _____	

MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION	COMMENTS	
		SPEC NO	SPD PART NO	DESCRIPTION
R1 POTENTIOMETER	MS AUDIO VOX SENS	ME 444-0059 -		
R2 ↓	MASTER VOL	↓ -		
ROTARY SWITCH S11	XMIT / ICOM MOLE	ME 452-0093 - 5024	1003512-01	4 POS - 2 POLE
DIGITAL SWITCH S9	VOLUME	ME 452-0134 -		5 SECTION
R3 POTENTIOMETER	MS LIGHTING FLOOD	ME 444-0059 -		
T1 TRANSFORMER	PANEL	MC 446-0034 - 5001		OFF - DIM - BRT.

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-73 C102		0	3	A				3/26/76	PANEL
32073A10A2		13-19-75		B				ENG. <i>mmwain</i>	R10A2
				C				APPR. _____	

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CHANNEL SPEC NO	CORE LOC SPD PART NO	FEEDER BUS	SEE SKETCH	COMMENTS
BUS CONTR	CB 1		MC454-0026	1003396-01			
			-				
BATT ESS 3AB	CB 2		-				

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730107		0	3	A				3/24/76	PANEL
30V73 A11A1		12-19-75		B				ENG. M. W. Rinder	R11A1
R11A1				C				APPR.	1 OF 2

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION		COMMENTS
		SPEC NO	SPD PART NO	DESCRIPTION
METER M1	DC VOLTS	MC432-0237-0001	2058911-01	20-45 VOLTS
↓ M2	DC AMPS	MK432-0237-0003	2058911-03	0-500 AMPS
ROTARY SW S1	BATT	ME 752-0093-5029	100.3512-02	6 POS 1 POLE

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730103		0	3	A				3/26/76	PANEL
32073 R11A1		12-19-75		B				ENG. <i>MW Qinder</i>	R11A1
				C				APPR. _____	

## SWITCH LISTINGS

SWITCH NAME		TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL SPEC NO	CORE LOC. SPD PART NO	SEE SKETCH	NO DI AT THIS POSITION	COMMENTS DESCRIPTION
S1	WIDE BAND RECORDER CONTROL	7	OPERATE	(A)-6208	1003370-3		STBY	ON-OFF-*ON
			*ERASE					
S6	FDM CONTROL	7	*AUTO CALBR				DATA	
			MAN CALBR					
S9	PCMU PWR	3	1	(A)-6103	1003370-01		OFF	ON-OFF-ON
			2					
S9	PCM RECORDER CONTROL	7	OPERATE	(A)-6203	1003370-03		STBY	ON-OFF-*ON
			*ERASE					
S11	WIDE BAND PWR A	1	ON	(A)-6101	1003370-02			ON-ON
			OFF	-	-			
S12	B	1	ON					
			OFF	-	-			
S14	MID MDM DSC MNA A	1	ON					
			OFF	-	-			
S15	B	1	ON					
			OFF	-	-			
S16	C	1	ON					
			OFF	-	-			
S17	MID MDM DSC MNA A	1	ON					
			OFF	-	-			
S18	B	1	ON					
			OFF	-	-			

\* = MOM.

(A) = ME 454-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-73 0102		0	3	A				3/26/76	PANEL
32V73 A11 A2		12-19-75		B				ENG. MW Ginder	R11A2
R11A2				C				APPR.	10F5

## SWITCH LISTINGS

[illegible]

④ = ME 454-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-73 0102		0	3	A				3/26/76	PANEL
32V73 A11 A2		12-19-75		B				M. W. Link	R11 A2
				C					20F5

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CHANNEL SPEC NO	CORE LOC SPD PART NO	FEEDER BUS	SEE SKETCH	COMMENTS DESCRIPTION
FORWARD DFI BUS 1 MNC WIDE BAND			ML454-0026	1003346-01			
A	CB1		-				
B	CB2		-				
T	CB3		-				
MDM DSC							
A	CB5		-				
B	CB6		-				
PCM RCOR	CB9		-				
WIDE BAND RCOR							
A	CB10		-				
B	CB11		-				

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.
V670-730102		0	3	A			
32V73A11A2		1078-75		B			
				C			

REL. DATE	3/24/76
ENG.	mwander
APPR.	

TITLE

PANEL  
R11A2

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CHANNEL SPEL NO	CORE LOG SND PART NO	FEEDER BUS	SEE SKETCH	COMMENTS DESCRIPTION
FORWARD DFI BUS 1MMC			MC454-0026	1003396-01			
FM XMTR	CB12		-				
LEFT SEAT SUIT			-				
VENT FAN MNA	CB13		-				
VENT FAN MNB	CB14		-				
RIGHT SEAT SUIT			-				
VENT FAN MNA	CB15		-				
VENT FAN MNB	CB16		-				
SIGNAL CONDITIONERS			-				
ARS			-				
AC2 ØB	CB17		-				
FREON			-				
AC3 ØA	CB18		-				
AG			-				
POT H <sub>2</sub> O			-				
AC2 ØB	CB19		-				

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
V170-730103		0	3	A				3/26/76	PANEL
32V73A11A2		12-19-75		B				ENG. m.w. Rinker	R11A2
				C				APPR.	4055

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION	COMMENTS	
		SPEC NO	SPD PART NO	DESCRIPTION
S2 ROTARY SW	DEVELOPMENT FLIGHT INST. WIDEBAND A RECORDER MODE	ME452-0093 - 5025	1003512-01	4 POS 2 POLE
S3	WIDEBAND B RECORDER MODE	↓	↓	↓
S10	PCM RECORDER MODE	↓	↓	↓
↓ S7	FDM MAN CAL BR	Y - 5028	1003512-02	6 POS 3 POLE

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		C	3	A				3/24/74	PANEL
32073 A11A2		12-14-75		B				ENG. MW Rinder	R11A2
				C				APPR.	

PANEL

R11A2

SIMULATOR

SMS

PAGE 5 OF 5

⑧ = ME 452-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-73010;		0	3	A				3/26/76	PANEL
33473 A12 A1		12-19-75		B				monahan	- R12 A1
				C					

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730102		0	3	A				3/26/76	FAYEL
30053 A2A1		12-14-75		B				max ainder	P20A1
				C					

## SWITCH LISTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN-CLATURE	CHANNEL SPEC NO	CORE LOG. SPEC PART NO	SEE SKETCH	NO PI ATT'N'S POSITION	COMMENTS DESCRIPTION
<u>SBAND</u>		KU	Ⓢ-6101	100330-02			ON - ON
<u>PM</u>		- S	—	—			
<u>UPLINK</u> DATA SOURCE	1	1	—	—			
PREAMP	1	2	—	—			
DATA RATE	1	HIGH	—	—			
		LOW	—	—			
		ON	—	—			
<u>CODING</u>	1	OFF	—	—			
<u>UPLINK/DOWN LINK</u>		SW ASSY					
ANT	1	2	—	—			
		1	—	—			
XPNDER	1	2	—	—			
		1	—	—			
NSP	1	2	—	—			
		SGLS	Ⓢ-6103	100330-01		STON	ON - OFF - ON
<u>MODE</u>	3	TDRS					
<u>DOWN LINK</u>		ON				STRY	
PWR AMP	3	OFF					
		ON				STRY	
	3	OFF	—	—			
		HIGH	Ⓢ-6101	100330-01			ON - ON
DATA RATE	1	LOW	—	—			

Ⓢ = MF 452-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VL 70-73 J107	0	3	A	—	—	—	3/26/70	PANEL
	30V73 A12A2	12-19-75		B	—	—	—	ENG. m.w. Ginter	RR A2
				C	—	—	—	APPR. —	10F4

## SWITCH LISTINGS

SWITCH NAME	TYPE SWITCH	SWITCH NOMEN- CLATURE	CHANNEL SPEC NO	CORE Loc. SPD PART NO	SEE SKETCH	NOTES AT THIS POSITION	COMMENTS DESCRIPTIONS
SBAND PM DOWNLINK CODING	1	ON	⊗-6101	1003370-02			ON - ON
		OFF	—	—			
GCILC PAYLOAD	3	1	⊗-6102	1003370-01		[N]	ON - OFF - ON
		2					
CONTROL	1	COMMAND	⊗-6101	1003370-02		— F	ON - ON
		PANEL	—	—			
SYSTEM	3	1	⊗-6102	1003370-01		OFF	ON - OFF - ON
		2					
RCVR SENS	3	HIGH				MED	
		LOW					
XMTR DWR	3	HIGH				MED	
		LOW					
MODE	1	DTCHD	⊗-6101	1003370-02			ON - ON
		ATCHD	—	—			
ANT POLAR	1	LCIRC					
		RCIRC	—	—			
MODIFIER	1	1.0					
		0.3	—	—			
ALO	1	XMTR SWP					
		NORM	—	—			

⊗ = ME 452-0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
	VL 70-730102	0	3	A				3/26/76	PANEL
	32073A12A2	12-17-75		B				ENG. maw Amber	R12A.2
				C				APPR.	2 OF 4

## SWITCH LISTINGS

[illegible]

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OF POOR QUALITY

④ = ME 452 - 0102

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730107		0	3	A				3/24/76	PANEL
32V73A12#2		12-19-75		B				MAN AIRER	R12A2
				C					

PANEL R12 A2 SIMULATOR SMS PAGE 3 OF 4

## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION	COMMENTS	
			SPD PAGE NO	DESCRIPTION
523 ROTARY SW	FM SOURCE	ME452-0093 —		8 POS
522 DIGITAL SW	SEAND FREQUENCY	MC452-0134 —		6 SEC.

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REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730-02		0	3	A				3/26/76	PANEL
30073A13-1		12-14-75		B				ENG. <i>MWRinder</i>	R17A2
				C				APPR. _____	

\* = MOM.      @ = ME 450 - 0100  
[N] = null position

PANEL R13A7 SIMULATOR SMS PAGE 1 OF 2

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REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-72 0107		0	3	A				3/26/76	PANEL
30 V 73 A13A1		12-10-75		B				ENG. <u>MWR</u>	R13A1
				C				APPR. _____	



## MISCELLANEOUS COMPONENTS

TYPE OF EQUIPMENT	NAME	DISPOSITION SPEC NO.	COMMENTS
EVENT INDICATION	MAINTENANCE/LOOP RECORDER	MC432-0822	3 STATE RECORD - E.F. - DUMP
DS4	RECORDED	↓	↓
DS1	CONTROL	↓	PANEL - ?
DS2	ANOMALY SERVICE USE PAYLOAD RECORDER	↓	2 STATE GRAY - REF.
DS7	CONTROL	↓	PANEL - ?
DS5	RECORD	↓	2 STATE GRAY - B.P.
DS6	DUMP	↓	↓
S7 ROTARY SW	MAIN/LOOP RCP VOICE SELECT CHANNEL 1	ME45-0093-5028	6 POS - 2 POLE
S8	CHANNEL 2	↓	↓
S10	PAYLOAD RECORDER MODE	ME452-0093	8 POS -
S11	SPEED IMP	↓ - 5025	4 POS - 2 POLE

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REF. DWG. NO. VL 70-730000	REV. PAGE	REV. DATE	ENG. APPR.	REL. DATE 3/26/76	TITLE PANEL R13A2
30 JUNE 1972	A B C			ENG. <i>Mowbray</i>	
				APPR.	

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CHANNEL SPEC NO	CORE LOG. SPD PART NO	FEEDER BUS	SEE SKETCH	COMMENTS DESCRIPTION
<u>MNA</u> <u>AUDIO</u>							
AUDIO CONTR	CB1		ML 454-0026	1003396-01			
			-				
MS OSS	CB3		-				
			-				
MID DECK CCU	CB4		-				
			-				
<u>RIGHT</u> <u>AFT CAMERA</u>	CB5		-				
CAMA PAN TILT PWR	CB17		-				
			-				
CAMA HTR	CB18		-				
			-				
PAN HTR	CB19		-				
			-				
VISU RCU	CB20		-				

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730103		0	3	A				3/26/76	PANEL
33073A15A2		12-19-75		B				in w/center	R15A2
				C				APPR.	

## CIRCUIT BREAK LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CHANNEL SPEC NO.	CORE LOC SPD PART NO.	FEEDER BUS	SEE SKETCH	COMMENTS DESCRIPTION
<u>MNA</u>							
MON 1	CB21		MC454-0026	1003396-01			
RIGHT MANIP ARM			-				
CAMR							
PAN TILT PWR	CB30		-				
CAMP HTR	CB31		-				
PAN TILT HTR	CB32		-				
RVA	CB33		-				
UHF							
XCVR 1	CB34		-				
MS FLOOD			-				
JETTISON							
COMM ANT LEFT			-				

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730102		0	3	A				3/26/76	PANEL
32V 73 A15A2		12-19-75		B				ENC. <i>max disher</i>	R15A2
				C				APPR.	2 OF 10

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	<del>CHANNEL</del> SPEC NO	CORE LOC SPD PART NO	FEEDER BUS	SEE SKETCH	COMMENTS DESCRIPTION
MNA JETTISON			MC 454-0026	1003396-01			
MAIP ARM RIGHT			-				
EXTEND TUNNEL			-				
MNC AUDIO							
MID DECK SPKR	CB6		-				
LEFT PAYLOAD 1	CB7		-				
SIG PROC	CB8		-				
INTRG	CB9		-				
COMSEC	CB10		-				
FWD CAMERA							
CAMP PANTILT PWR	CB22		-				

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-730103		0	3	A				3/24/76	PANEL
32V 73A15A2		12-19-75		B				mw Ginder	R15A2
				C				APPR.	30F10

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPALE)	CHANNEL SPEC NO	CORE LOC. SPD PART NO	FEEDER BUS	SEE SKETCH	COMMENTS DESCRIPTION
MNB FWD CAMERA			ML454-0026	1003396-01			
CAMP HTR	CB23		-				
PAN TILT HTR	CB24		-				
VSU/RCV	CB25		-				
MON2	CB26		-				
GCILU LEFT MANIP ARM	CB27		-				
CAMP PAN TILT PWR	CB25		-				
CAMP HTR	CB26		-				
PAN TILT HTR	CB27		-				

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REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730103		0	3	A				3/24/76	PANEL
32V73 A15A3		12-A-75		B				ENG. M. W. B. B.	R15A2
				C				APPR.	40E10

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CHANNEL SPEC NO	CORE LOG SPD PART NO	FEEDER 'BUS	SEE SKETCH	COMMENTS DESCRIPTION
<u>MNB</u>			<u>MC454-0026</u>	<u>1003396-01</u>			
<u>KU B</u>	<u>C038</u>		<u>-</u>				
<u>SBAND PML</u>			<u>-</u>				
<u>PREAMP</u>	<u>C042</u>		<u>-</u>				
<u>NSP</u>	<u>C043</u>		<u>-</u>				
<u>COMSEC</u>	<u>C044</u>		<u>-</u>				
<u>XPNDR</u>	<u>C045</u>		<u>-</u>				
<u>ANT SEL</u>	<u>C046</u>		<u>-</u>				
<u>FMI</u>							
<u>SIG PROC</u>	<u>C052</u>		<u>-</u>				
<u>XMTR</u>	<u>C053</u>		<u>-</u>				

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REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-73 0102		0	3	A				3/26/74	PANEL
30073 A15A2		12-19-75		B				ENG. <u>M. W. Ginder</u>	A15A2
				C				APPR. _____	50510

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CHANNEL SPEC NO	CORE Loc SPD PART NO	FEEDER BUS	SEE SKETCH	COMMENTS DESCRIPTION
MNB			ML454-6026	003396-01			
DPLR EXTR 1	CB54		-				
PS FLOOD			-				
JETTISON COMMAND			-				
LEFT			-				
RIGHT			-				
MAIP ARM LEFT			-				
MNC			-				
AUDIO			-				
AUDIO CONTR	CB11		-				
PS ALCK	CB12		-				
PAYLOAD 2			-				
SIG PROC	CB14		-				

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		0	3	A				3/26/76	PANEL
32V73 A15A2		12-19-75		B				ENG. <i>M. W. Gander</i>	R15A2
				C				APPR. _____	6 OF 10

CIRC	EAKEE NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CHT SPEC NO	CORE LOC SPDPART NO	FEEDER BUS	SEE SKETCH	COY 2-3 DESCRIPTION
	MNC SBAN PM 2 PREAMP	CE47		MX454-0026	1003396-01			
				-				
	NSP	CB 48		-				
				-				
	COMM SEL	CE49		-				
				-				
	X PNDP	CE50		-				
				-				
	ANT SEL	CE51		-				
				-				
				-				
				-				
				-				
				-				

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL70-730102		0	3	A				3/26/76	PANEL
33073 PIER 2		12-14-75		B				M. W. Linker	R15A2
				C					

## CIRCUIT BREAKER LISTING

CIRC	BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO. (IF POPPABLE)	CH TEL SPEC NO	CORE LOG SPPD PER 100	FEEDER BUS	SEE SKETCH	CD DESCRIPTION
	MVC PAYLOAD			MC454-0026	1003396-01			
	INTIG	CE15		-				
	COMSEC	CE16		-				
	TUCAMERA	CE25		-				
	GCILU	CE29		-				
	RUSIG PROC	CE40		-				
	UHF RCVR 3	CE41		-				
				-				
				-				

REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-70000	0	A	3					3/26/76	PANEL
20070 HISA	12-10-75	B						ENG. <i>max</i>	RIS A2
		C						APPR.	

## CIRCUIT BREAKER LISTING

CIRCUIT BREAKER NAME	A/C CB NO.	C.B. AMPERAGE AND PART NO (IF POPPABLE)	CHANNEL SPEC NO	CORE LOC PART NO	FEEDER BUS	SEE SKETCH	COMMENTS- DESCRIPTION
MNC FM2			MC454-0026	SPD PART NO 1003396-01			
SIG PROC	C855		—				
X-MTR	C856		—				
DPLR EXTR 2	C857		—				
MAIN LOOP RCOR	C857		—				
1	C857		—				
2	C857		—				
JETTISON							
COMM ANT			—				
MAIP #1M							
LEFT			—				
RIGHT			—				

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REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-230103		0	3	A				3/26/76	PANEL
20073 AIS A2			12-19-75	B				ENG. M. W. Bunker	R 15 A2
		C						APPR.	9 of 10

## CIRCUIT BREAK LISTING

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REF.	DWG. NO.	REV.	PAGE	REV.	DATE	ENG.	APPR.	REL. DATE	TITLE
VL 70-73 0109		0	3	A				3/26/76	PANEL
32 V 73 A15 A2		12-19-75		B				mmw Ginder	R15A2
				C					10 OF 10

"SMS-EDR"

IDENTIFYING  
INCREMENTAL SECTION  
RELEASE SHEET

The following is part of Section 22, WP #22.

Instructor/Operator Stations

ENGINEERING DESIGN REPORT  
INSTRUCTOR STATION/OPERATOR STATION/OBSERVER STATION

1.0 Scope

This section of the Engineering Design Report describes the intended design approach for two instructor stations,

- a) FBIS - Fixed Base Instructor Station
- b) MBIS - Moving Base Instructor Station;

two operator stations,

- c) FBOS - Fixed Base Operator Station
- d) MBOS - Moving Base Operator Station;
- e) OBS - Observer Station for the SMS.

2.0 General

The following paragraphs describe the hardware design approach for these stations. A tabular listing of the functions of various controls and indicators is also provided.

These consoles were planned for ease of operation and are in full compliance with MSFC-STD 267A, MIL-STD-1472 and other relevant specifications. The panels of the consoles are wrapped to optimize viewing angles.

All items of console panel hardware have been carefully selected to provide the user with an optimal balance of functional suitability, reliability, and maintainability. The number of different kinds of hardware has been kept to a minimum to minimize the spare parts provisioning problems. Indicator lights and switch lights will be provided with dual,

long-life lamps. A lamp test capability will also be provided. See Table 3.1-1 for list of panel hardware to be used.

Switch lights and indicator lights will be color coded as follows:

- 1) Green lights will represent an ON condition.
- 2) Red light will denote an emergency feature.

EMER STOP will be red.

3) Yellow will represent caution. Motion interlock lights will be yellow.

4) White lights will describe other indications, positions or conditions that represent system status.

### 3.0 Design Considerations

#### 3.1 Configuration

Five stations, including materials converted from OAS, SHALL BE PROVIDED WITH THE SMS complex for proper simulator control and monitoring of trainees' reactions to their training situations.

##### 3.1.1 FBIS, MBIS

The FBIS (Fixed Base Instructor Station) and the MBIS (Motion Base Instructor Station) shall be located external of their corresponding SMS crew stations. Figure 3.1-1 shows the FBIS and MBIS Plan View. Figures 3.1-2 and 3.1-3 summarize the configurations of the instructor complexes with panoramic views of the panel surfaces of MBIS and FBIS respectively.

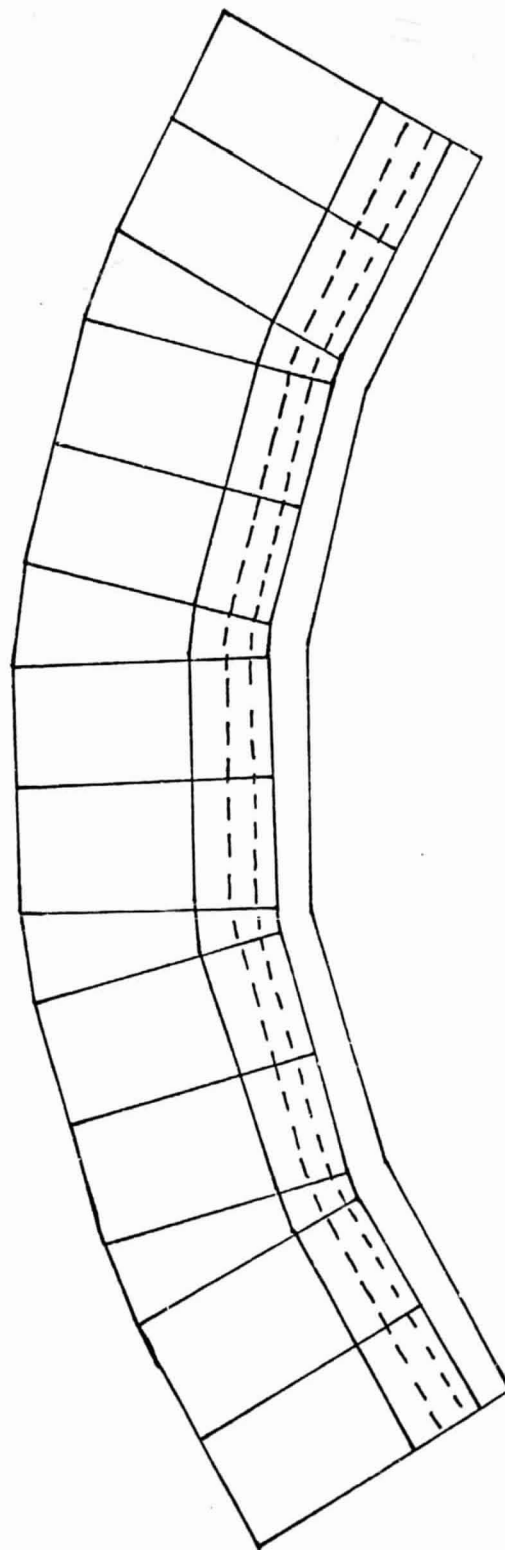


FIGURE 3.1-1 PLAN VIEW OF THE FBIS AND MBIS CONSOLE

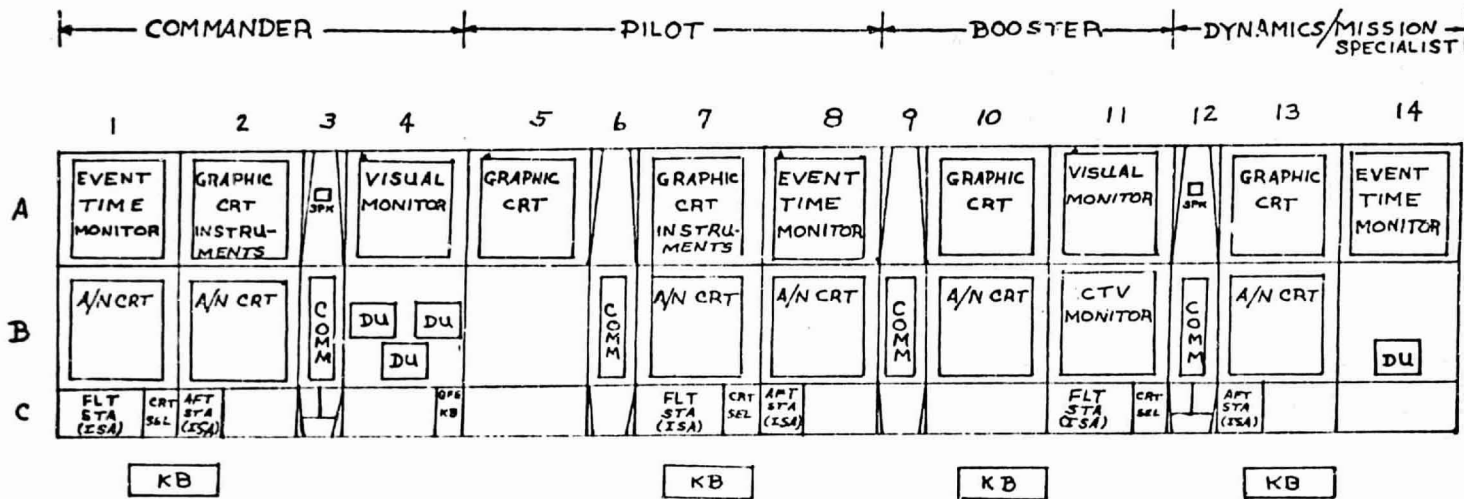


FIGURE 31-2 PANORAMIC VIEW OF THE FBIS CONSOLE

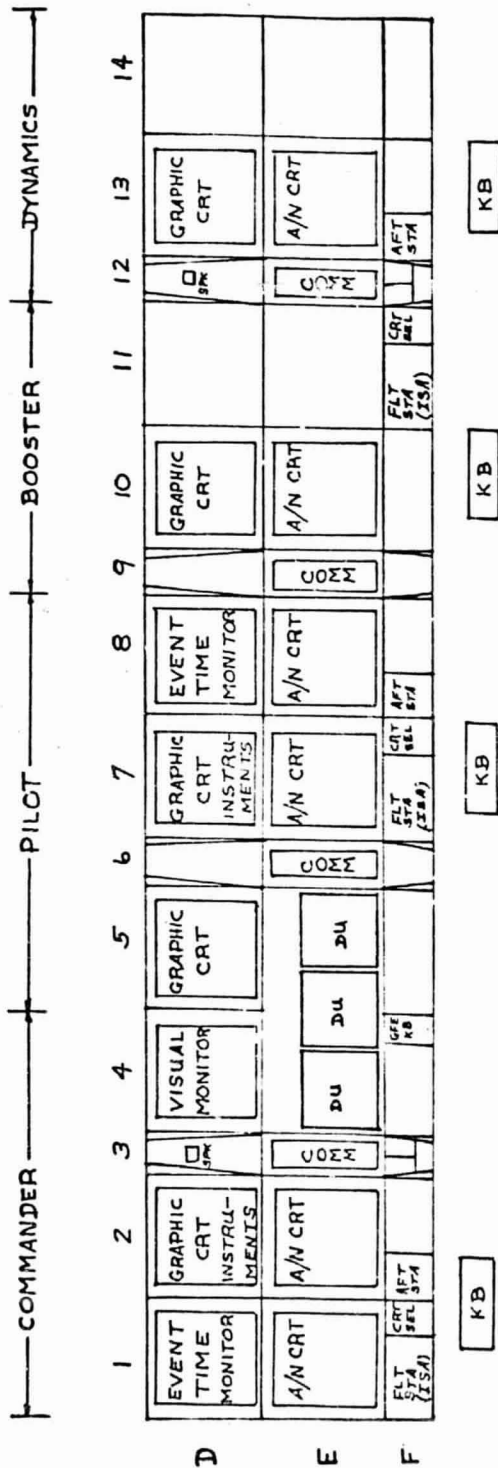


FIGURE 31-3 PANORAMIC VIEW OF THE MBIS CONSOLE

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The Instructor personnel shall consist of a Commander Instructor, a Pilot Instructor, a Booster Instructor, and a Dynamics Instructor.

3.1.1.1 The instructors shall be assigned the following displays.

	<u>FBIS</u>	<u>MBIS</u>
1) Commander Instructor		
1-Event Time Monitor	X	X
1-Graphic CRT (Instrument Display)	X	X
2-A/N (Alphanumeric) CRT	X	X
1-Visual Monitor (Forward Windows)	X	X
2) Pilot Instructor		
1-Event Time Monitor	X	X
1-Graphic CRT	X	X
1-Graphic CRT (Instrument Display)	X	X
2-A/N CRT	X	X
NOTE: Three Display Units (DU's) will be shared by Commander and Pilot Instructors. These DU's are repeaters of their cockpit counterparts, and they will be flight hardware for the FBCSS and TAC units for the MBCSS.		
3) Booster Instructor		
1-Graphic CRT	X	X
1-A/N CRT	X	X
1-Visual Monitor (Aft Windows)	X	
1-CCTV Monitor	X	

	<u>FBIS</u>	<u>MBIS</u>
4) Dynamic Mission Specialist Instructor (FBCSS) Dynamics Instructor (MBCSS)		
1-Graphic CRT	X	X
1-A/N CRT	X	X
1-Event Time Monitor	X	
1-Display Unit	X	

3.1.1.2 Each instructor shall have a separate Communications Panel (COMM Keyset). Emergency stop (EMER STOP), lighting and aural controls shall be placed on the first and the fourth "pie" section to provide ready access by all instructor personnel. The instructors shall monitor all crew activities and control the training exercise from the FBIS and MBIS.

3.1.1.3 The instructor consoles are comprised of ten straight sections and four wedge sections. The consoles are wrapped both horizontally and vertically to place panels so that they can be viewed by the four seated instructors. All wedge sections are designed for a 15° wrap. The front of the console cross-section includes, from bottom to top:

- 1) A kick space.
- 2) A 16-inch-deep shelf whose bottom is 25 inches off the floor. Keyboards for each instructor are placed on this shelf.
- 3) A 10-inch-high lower panel whose top shall be tilted at approximately 45° angle.
- 4) A 24-inch-high vertical panel.

5) A 24-inch-high upper panel whose top shall be tilted forward approximately 30°.

6) A cap containing the lighting illuminating the console.

3.1.1.4 Elements peculiar to a given instructor, such as keyboards, CRT's and communication controls, are positioned at or near the ends of the console. This philosophy required duplication of certain controls, to assure ready access by console personnel.

3.1.1.4.1 CRT's have been allocated to the console panels where they can best be utilized. For example, A/N CRT's are prime displays and are positioned so that they can be viewed conveniently and used easily in conjunction with their associated keyboards; the DU's and visual monitor CRT's are positioned where they can be shared by two instructors.

3.1.1.4.2 Comm keysets are placed on the rectangular panels of the "pie" sections where they can be easily reached.

3.1.1.5 The recorders, i.e., the X-YY' plotters furnished by Singer and the GFE strip-chart X-T recorders, are free-standing cabinets located near the console, but with flexibility in positioning. They provide hardcopy records of simulator parameters.

3.1.2 FBOS, MBOS

The FBOS (Fixed Base Operator Station) and the MBOS (Motion Base Operator Station) shall be located external of their

corresponding SMS crew stations. Operator personnel will consist of a Simulator Controller and a Simulator Coordinator.

3.1.2.1 The Operators (controllers) shall be assigned the following displays (c.f., Figure 3.1-5 thru 3.1-7):

	<u>FBIS</u>	<u>MBIS</u>
1) Simulator Controller		
1-Graphic CRT	X	X
1-Visual Monitor (Forward Windows)	X	X
1-Visual Monitor (Aft Windows)	X	
1-A/N CRT	X	X
1-CCTV Monitor	X	
2) Simulator Coordinator		
1-Graphic CRT	X	X
1-A/N CRT	X	X

3.1.2.2 The operator shall initialize all training situations and monitor the status of the simulator equipment. Figure 3.1-6 and 3.1-7 give panoramic views of FBOS and MBOS consoles.

3.1.2.3 The operator consoles are comprised of 4 straight sections. The console is wrapped vertically. The panels are positioned for convenient operation by two persons. The console sections are the same as those used for the instructor console. The front of the console cross section shall include, from bottom to top:

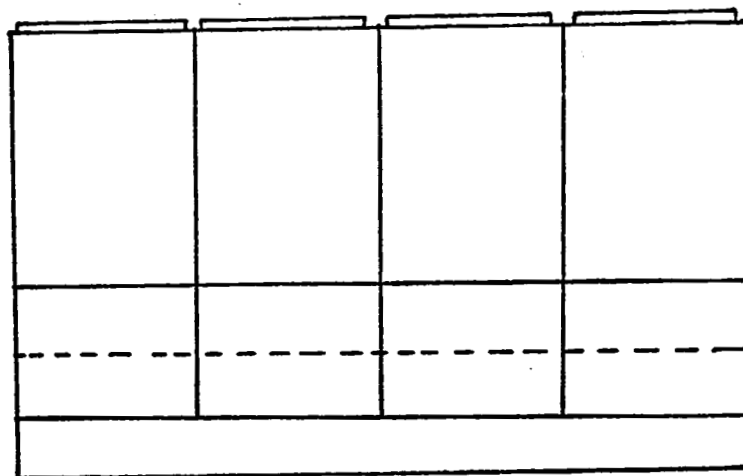


FIGURE 3.1-4 FBOS AND MBOS PLAN VIEW

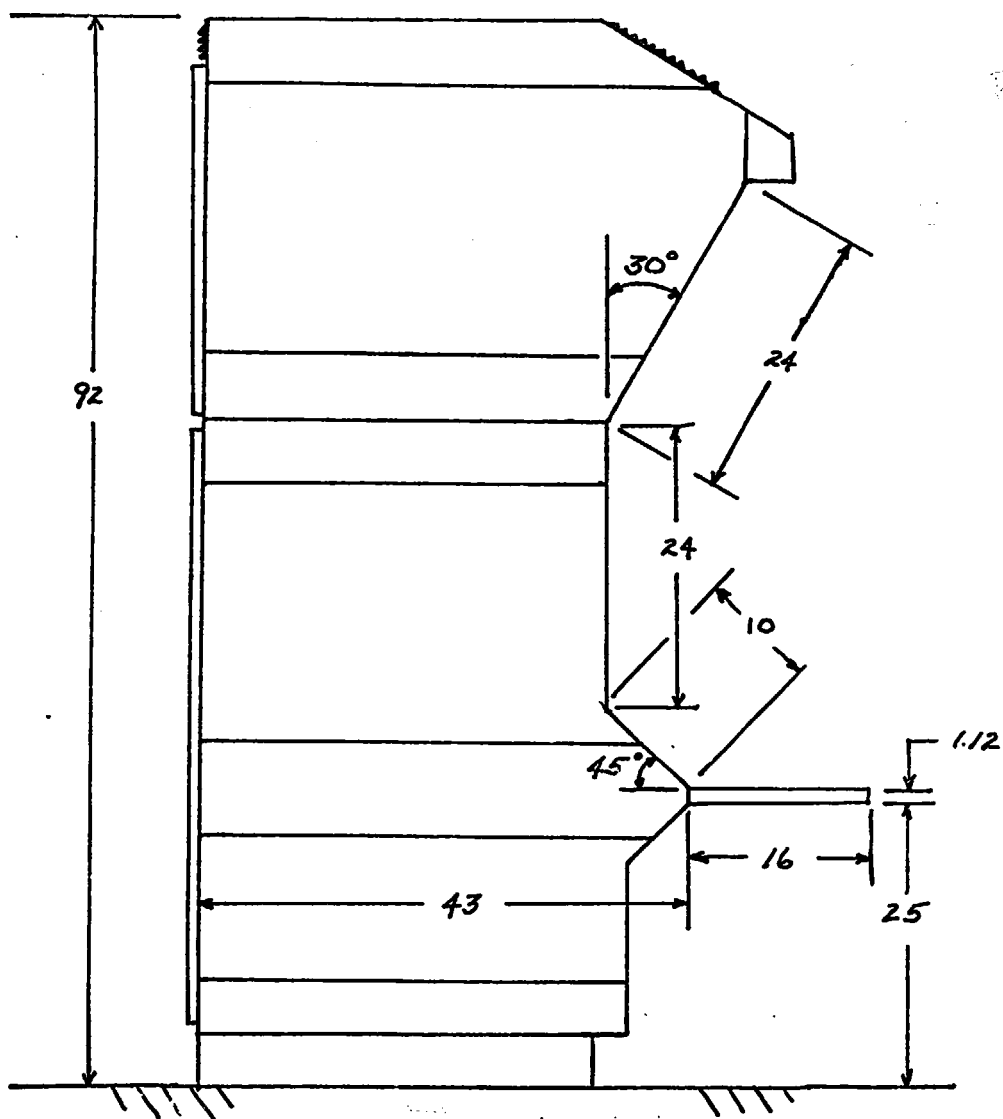


FIGURE 3.1-5 CROSS SECTION VIEW OF  
THE FBOS AND MBOS CONSOLES

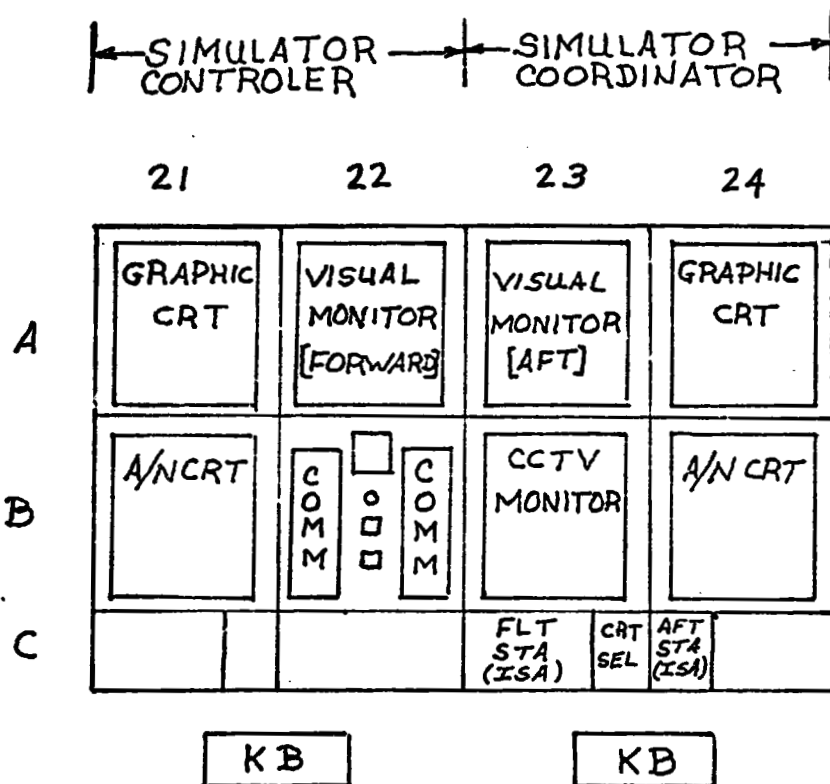


FIGURE 31-6 FBOS PANORAMIC VIEW

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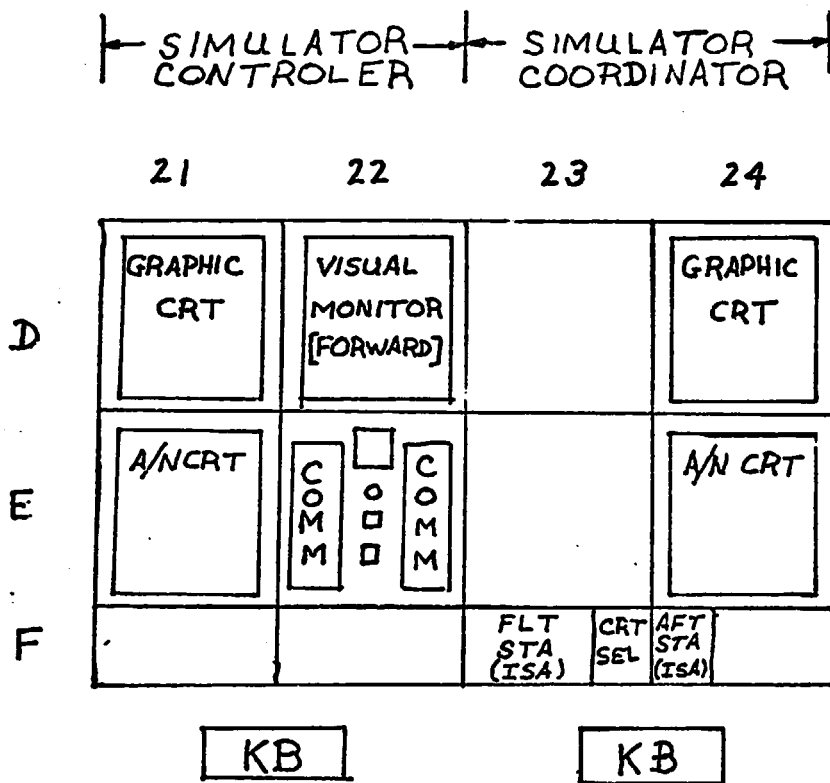


FIGURE 3.1-7 MBOS PANORAMIC VIEW

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- 1) A kick space
- 2) A 16-inch-deep shelf whose bottom is 25 inches off the floor. Keyboards for each instructor are placed on this shelf.
- 3) A 10-inch-high lower panel whose top shall be tilted at approximately a 45° angle.
- 4) A 24-inch-high vertical panel
- 5) A 24-inch-high upper panel whose top shall tilt forward approximately 30°
- 6) A cap containing the lighting illuminating the console.

3.1.2.4 The operator console has been designed to accommodate a Simulator Controller (left seat) and a Simulator Coordinator (right seat). Controls and displays which are to be accessible to both operators (Major Equipment Status and Master Power Control) are located toward the center of the console. The Simulator Controller has primary responsibility for initializing, controlling and monitoring the training mission. A CRT and keyboard, communications keyset, and status indicators are conveniently provided for the Simulator Controller. Both operators will share use of the visual system forward monitor (FBOS and MBOS), aft monitor (FBOS), and the speaker.

### 3.1.3 OBS

The OBS (SMS Observer Station) consists of a movable CRT and keyboard assembly. Two separate housings shall be designed to hold the movable assembly within the restrictions

imposed by the FBCSS and the MBCSS. The MBCSS will utilize the basic observer console used in the OAS. The profile of the single bay observer console is shown in Figure 3.1-10. The console will have an 8 inch shelf, a 7 inch 45° sloped control panel, and a 24 inch vertical panel. The console will be approximately 20 inches wide. The station consists of a raised seat (with seat belt) and a communications keyset. In addition, a console is provided which will have a CRT and associated alphanumeric keyboard (secured to shelf) and various simulator controls. This console is intended primarily for use as a checkout device during installation and test phases of simulator development. Systems engineering and programming personnel are provided the capability to control the simulation from the crew station for debug purposes. The console will be mounted behind the commander's seat. The design of the FBCSS allows access only thru a floor panel of approximately two feet square. This limited access precludes the reuse of the MBCSS console in the FBCSS. Therefore, a pedestal mount shall be designed for the FBCSS which will hold the CRT and keyboard assembly. FREEZE/RUN switch, and an EMER STOP switch (Figures 3.1-8 and 3.1-9).

Since these consoles are not intended for use during training, they shall be readily removable from the cabins. However, should the need arise, they can easily be re-installed for use by an in-cabin instructor for training or other purposes.

#### 3.1.4 ISA's

The panels in the FBCSS and the MBCSS are to be monitored by CRT panel displays as defined by NASA. Fast,

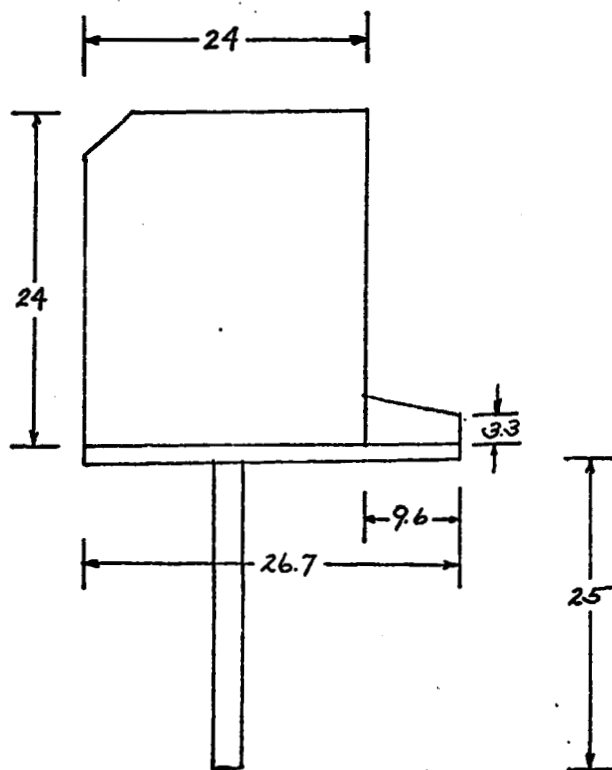
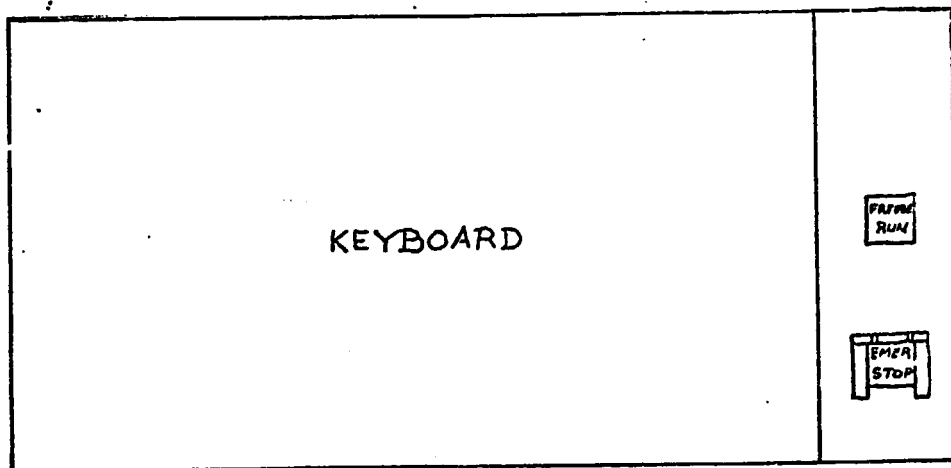
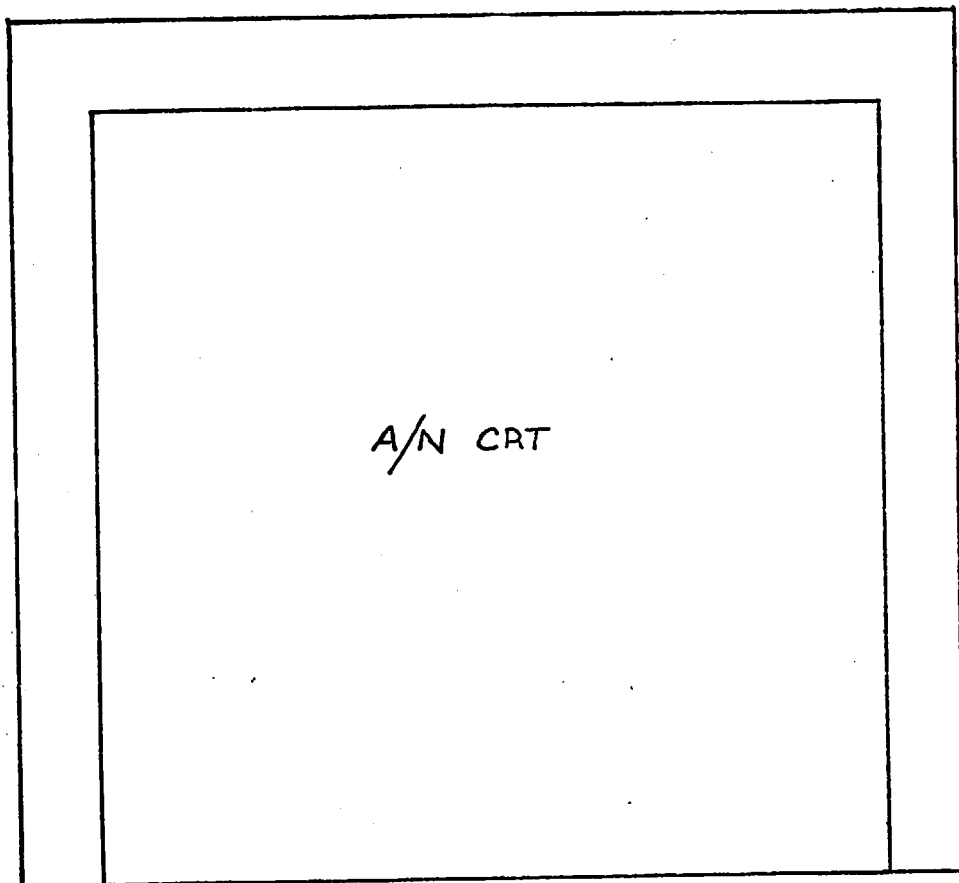


FIGURE 3.1-8 OBS PEDESTAL MOUNT  
CROSS SECTION VIEW



1 INCH

FIGURE 3.1-9 OBS PEDESTAL MOUNT  
PANORAMIC VIEW

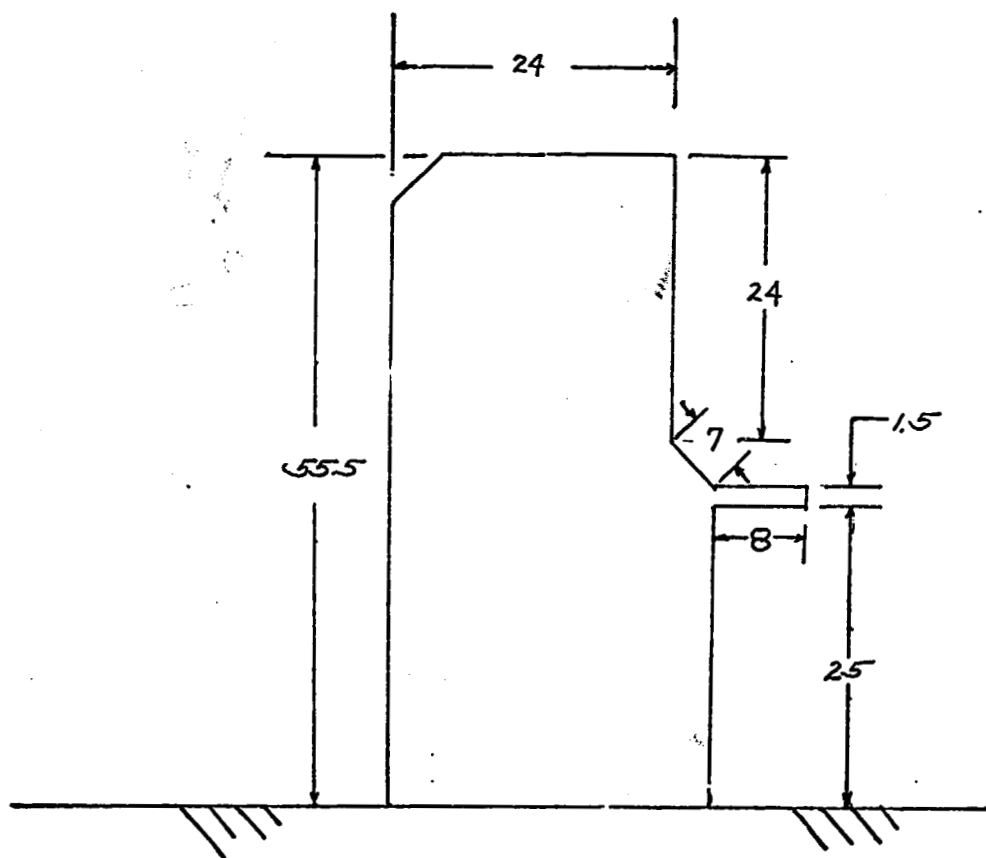


FIGURE 3.1-10 OBS CONSOLE MOUNT  
CROSS SECTION VIEW

accurate display of the pages on the appropriate CRT display shall be provided for by utilization of unlighted Isomorphic Switch Array (ISA). There shall be three ISA's on each of the instructor stations and one on each of the operator stations for a total of eight ISA's. The ISA was designed, as the name implies, to specially resemble the panels as they would be viewed within the cockpit by the crew.

#### 3.1.5 CRT selection

CRT selection panels shall be provided for all instructors' and operators' stations to permit quick display (and hard copy) of CRT pages peculiar to a particular console. There shall be a CRT SELECTION panel located between the FLT STA and AFT STA portions of the ISA's. There shall be one configuration for the instructors' stations (Figure 3.1-11) and another for the operators' stations (Figure 3.1-12). The greater number of CRT's on the instructors' stations as compared to the operators' station will require more switches on the CRT SELECTION panel.

#### 3.2 Operation

The instructor, operator, and observer consoles' Function List and Panel Sketches are included as attachment I and 2 to this section. It should be noted that the instructor station panel sketches of switch-lights and indicators lights have been coded to facilitate distinguishing them from each other. Switch-lights have a black bezel and indicator lights have no bezel.

### 3.2.1 CRT Display System

#### 3.2.1.1 Graphic CRT System

##### 3.2.1.1.1 Configuration Definition

The configuration as indicated by Figure 3-1 comprises a common interface to those sets of display equipment and one image recording system. Each of the three sets of graphic display equipment (systems A, B and C) comprise a graphic display system and a number of display indicators. The following quantities of display indicators per system will apply:

System - A	3 display indicators
System - B	2 display indicators
System - C	2 display indicators

In addition to the graphic display system and display indicator, there will be an image recording system forming part of system - B only. The interface of the graphic display system may provide the necessary remote control signals to the image recording system.

Each of the graphic display systems will be interfaced to the computer over a fully buffered interface. The computer side of this interface will be an Interdata Selector Channel (M73-105) which will support the three systems.

All equipment required by the configuration with the exception of the image recording system will be mounted in the IOS. The image recording system is to be installed in a free-standing enclosure.

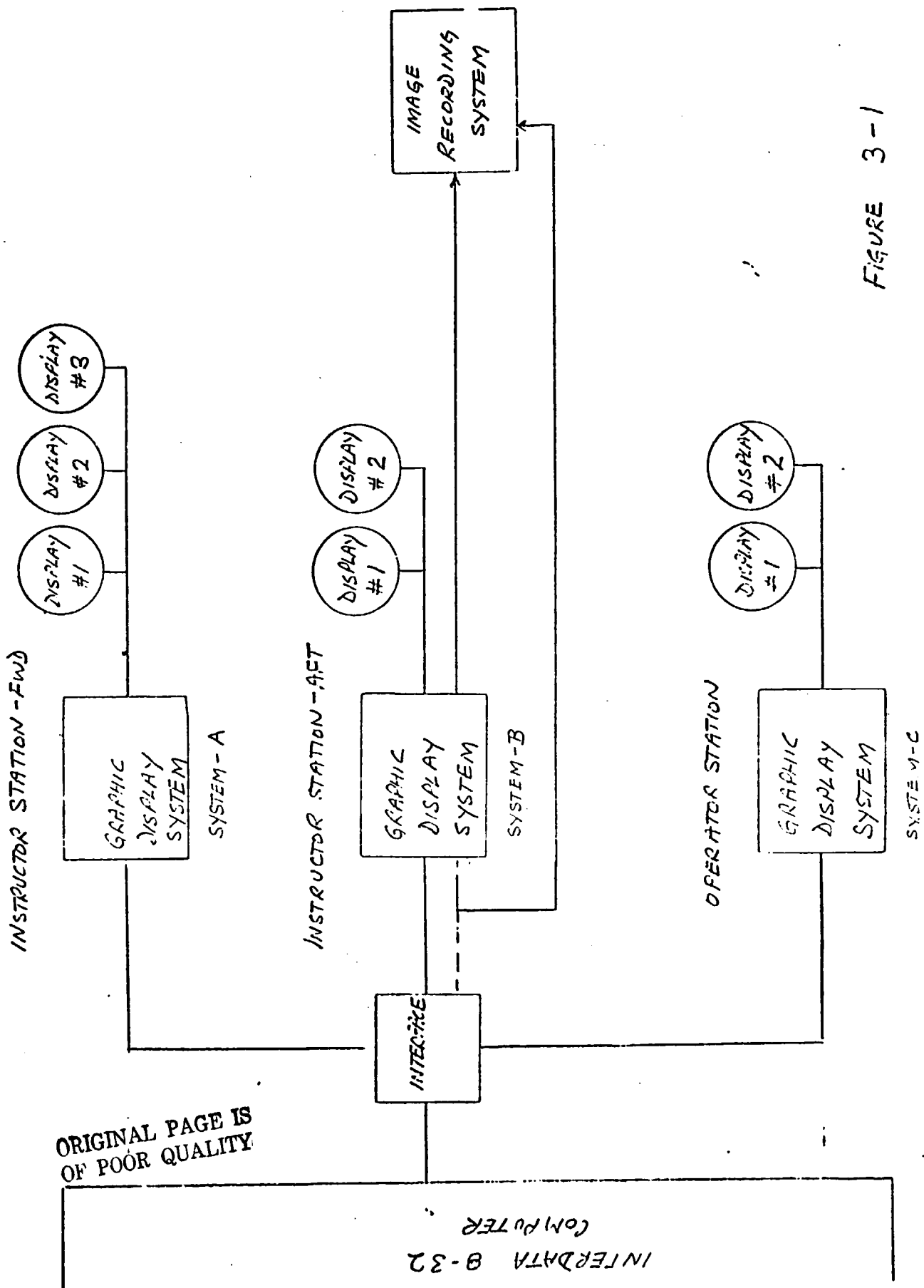


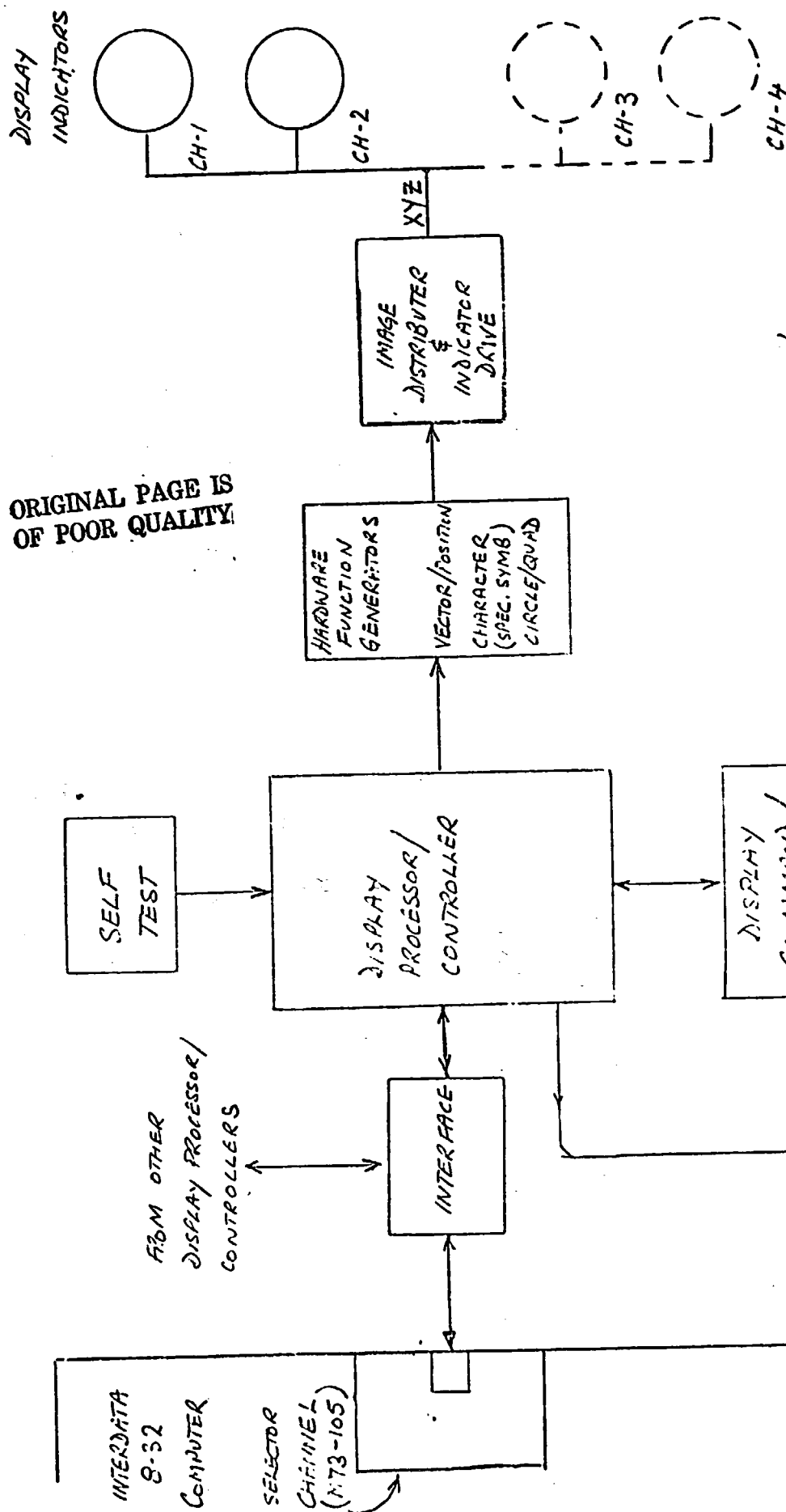
FIGURE 3-1

GRAPHIC DISPLAY SYSTEM  
CONFIGURATION

#### 3.2.1.1.1.1 Graphic Display System Definition

Each graphic display system will be a commercially available set of equipment which will be used to present alphanumeric characters, special symbols, vectors, and circles. The graphic display system depicted by Figure 3-2 represents a typical system where alternate components necessary to provide a functioning system may be added. The graphic display system will provide the following features:

- a) An interface to the computer will provide a two-way access between the computer and the display system.
- b) A display processor/controller which will process display instruction tests to effect the desired display images.
- c) A display command/refresh memory which will provide display command storage for the desired display images. A 12228 x 16 bit words of memory will be provided.
- d) Hardware function generators which will cause vecotrs, characters or special symbols, circles or quadrants of circles, and inter-image position moves to be implemented as the result of decoding display commands.
- e) Display drive electronics will provide the signal buffering required to drive the display indicators.
- f) The distributor will allow each display indicator to have completely independent, or simultaneous, outputs while multiplexing a single image generation system. Outputs for up to four (4) display indicators will be provided.



GRAPHIC DISPLAY SYSTEM  
COMPONENT DESCRIPTION

FIGURE 3-2

g) Horizontally aligned display indicators in accordance with the configuration will be provided and integrated with the display generation equipment.

h) A self test unit will be supplied as an integrated part of the graphic display system to allow off-line testing and verification of the system.

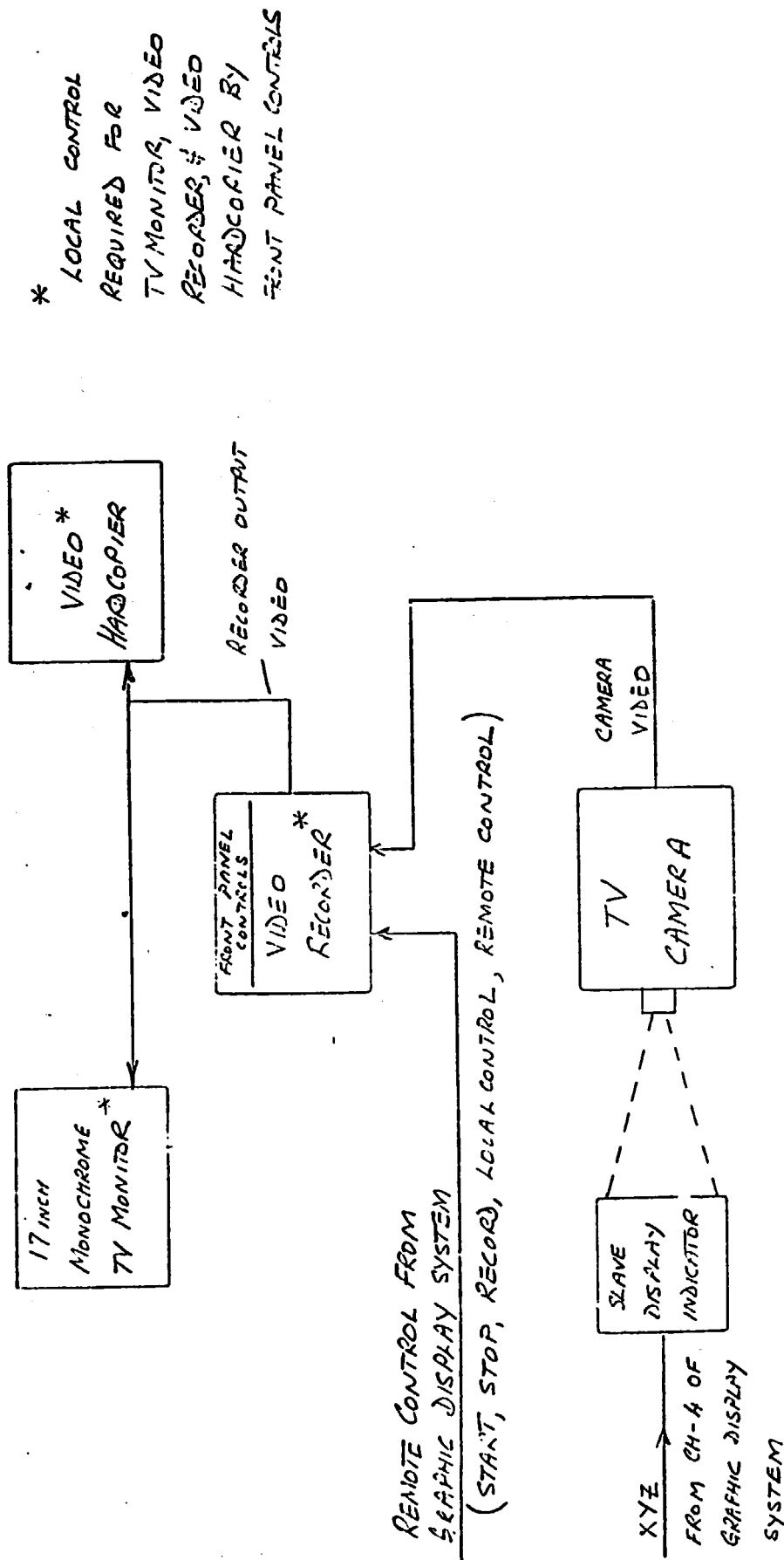
#### 3.2.1.1.1.2 Graphic Display Image Recording System

The capability will be provided to record on a video tape recorder or video cassette recorder images from a display indicator attached to a graphic display system with the objective of storing images for subsequent hardcopy reproduction.

##### 3.2.1.1.1.2.1 System Requirements

Figure 3-4 illustrates the functional system arrangement. The video recorder will be controlled via the interface between the computer and graphic display system to provide the functions of start, stop, record, local control, and remote control.

Each of the interfaces between the computer and graphic display systems will provide these control functions to allow commonality of all equipment in the system. The method of recording between the slave display indicator will be by a TV camera or equivalent scan conversion equipment (SCE). The output of the video recorder will be distributed to a 17 inch monochrome TV monitor, in a free standing cabinet, and also to a video hard copy device. All equipment including the slave display indicator, TV camera or SCE, video recorder, TV monitor



\* LOCAL CONTROL  
REQUIRED FOR  
TV MONITOR, VIDEO  
RECORDER, & VIDEO  
HARDCOPIER BY  
FRONT PANEL CONTROLS

GRAPHIC DISPLAY IMAGE  
RECORDING SYSTEM

FIGURE 3-4

ORIGINAL PAGE IS  
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and video hardcopy device will be contained in a separate cabinet or desk top enclosure. The local controls for the video recorder, TV monitor and hardcopy device will be easily accessible to operating personnel during a training period. The video recorder will provide up to 60 minutes of recording time assuming a continuous recording mode.

In the local mode of operation the operating personnel will be able to control the TV picture, the video recorder and the hardcopy device. The following capabilities will be provided.

Video Recorder - Rapidly advance the tape forwards or backwards; enable the modes for record, play and stop; set up video levels; freeze the image on a single field; and turn recorder on and off.

TV Monitor - Turn monitor on and off; control the picture horizontal and vertical hold, height and width, contrast and brightness, and focus.

Hardcopy Device - Turn device on and off; adjust the darkness of the resulting copy; and initiate the print process of the video image.

#### 3.2.1.1.1.2.2 System Application

Whenever a request for recording a particular image is received by the computer software the following events will occur. The respective image will be displayed on the slave CRT (Channel 4 of the graphic display system) and an interface command issued to start the video recorder in the record mode. After a suitable interval (5-10 seconds) the software

will issue an interface command to stop the video recorder and revert to the local mode of control. At this time the image on the slave display indicator is removed. By repeating this process, the system will be able to accumulate a series of short events on video tape. At some convenient time, the operating personnel will use the local controls to generated selected hardcopy prints of the recorded events by operating the video recorder, verifying the image on the TV monitor, and activating the print cycle.

#### 3.2.1.1.1.3 Computer to Graphic Display System Interface

The graphic display system will be designed to interface to an Interdata 8-32 general purpose data processing computer. The interface will allow bi-directional 16 bit data transfers over a data path between each graphics display processor and the computer. The data transfer will be implemented via a DMA type of interface at the selector channel side controlling block transfers of data. The total through put of the interface including selector channel set up, switching from one graphic display system to another, and the transfer of command memory data blocks shall be 20,000 words/second.

The interface at the display processor end will be self-supporting with respect to power. Both ends of the interface will be provided with line drivers and receivers, or equivalent devices, suitable for driving over the required cable lengths.

The interface will allow data to be transmitted between the display command memory and computer concurrent with data being processed by the display controller for refresh or any other controller activity. Transmittal of data to the display command memory will not be dependent upon the display

controller being on a stand-by or wait state at the end of a refresh frame. It will be possible via software control to transmit full page images or update information to any part of the display command memory. The interface will allow the read back, to the computer, or any portion of the display command memory as the result of a computer initiated command function.

An interrupt will be generated at the computer side of the interface whenever the following events exist: device on-line, data transfer complete, time-out, display list halt, and image X/Y overflow. Computer resident software will be able to respond to the interrupt and request additional status information from the graphics display system concerning the cause of the interrupt. It is desirable that interrupt causes can be selectively enabled and disabled.

To allow all graphic display systems to share a common interface to the computer an Interdata 8-32 Selector Channel (M73-105) will be used. The display vendor will provide an interface which is compatible with the selector channel and yet allow each of the graphic display systems in the configuration have equal access to this I/O channel. The display vendor will provide all the computer manufacturer's interface components, including the selector channel, to implement the required interface characteristics.

### 3.2.1.2 A/N CRT System

#### 3.2.1.2.1 Fixed-Base Installation (Configuration #1)

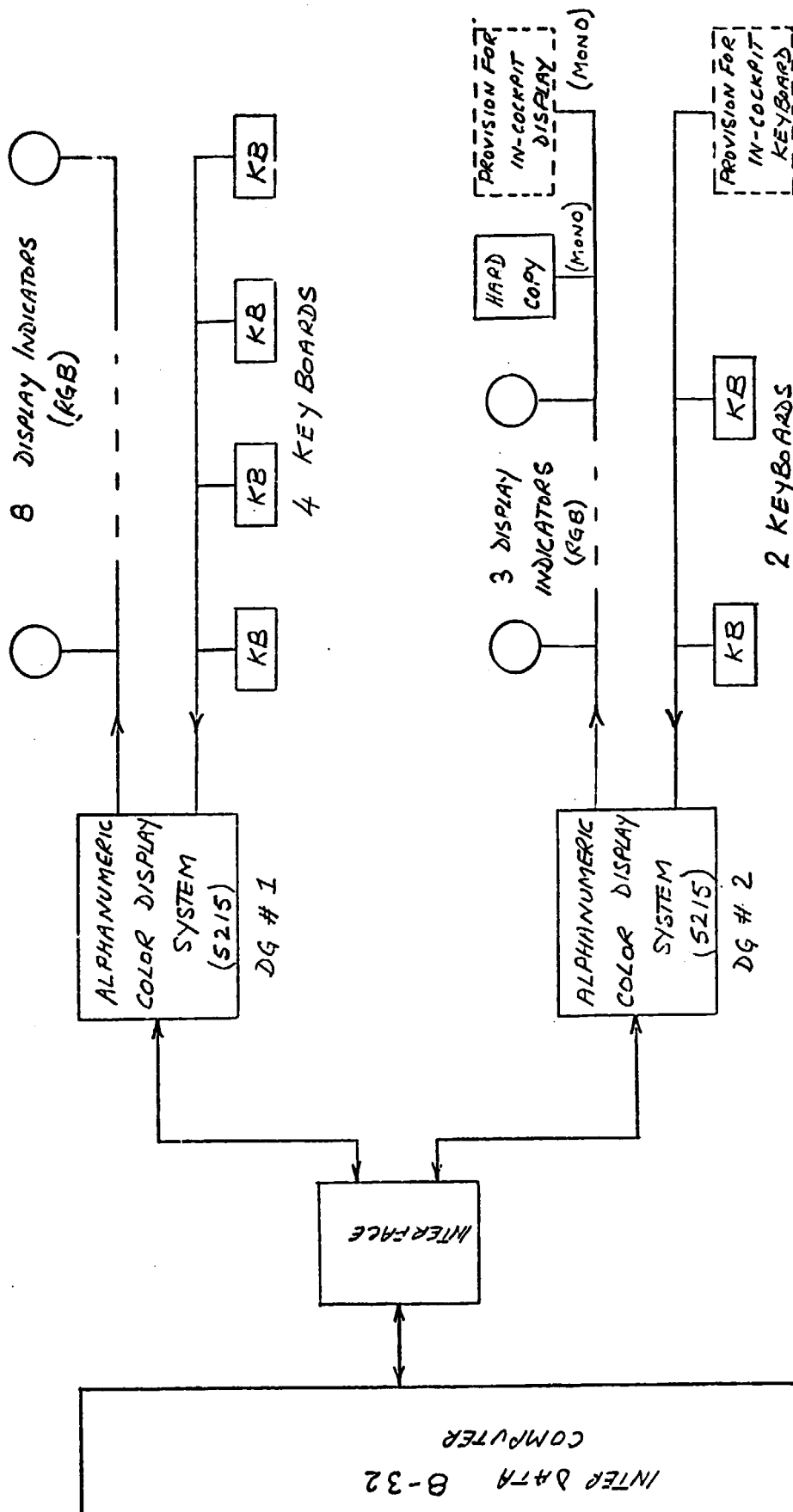
The configuration as indicated by Figure 3-1 will comprise a common interface to the Aydin 5215 alpha-numeric color display generators (DG#1 and DG #2). One display generator (DG #1) will support 8 color display indicators, and 4 keyboards. Another display generator (DG #2) will support 3 color display indicators, a monochrome hard copy device, two keyboards and the provision to accept and support the display indicator and keyboard defined by configuration #3. Control of the hard copy device will be provided via interface commands. Each of the A/N display systems will be interfaced to the computer over a fully buffered interface. The computer side of this interface shall be an Interdata Selector Channel (M73-105) which shall support the two display generators.

#### 3.2.1.2.2 Moving-Base Installation (Configuration #2)

The configuration as indicated by Figure 3-2 will comprise a common interface to the Aydin 5215 alpha-numeric color display generators (DG #1 and DG #2). This configuration is identical to that for configuration #1, except that the second display generator (DG #2) supports 2 rather than 3 color display indicators, in addition to the hard copy device, keyboards, and provision to accept and support the requirements of configuration #3.

#### 3.2.1.2.3 In-Cockpit Installation (Configuration #3)

This configuration shall provide one monochrome display indicator and one keyboard which will be able to be shared between the spare channels and receivers of configurations 1 and 2. Unlike the previous configurations, the equipment shall be able to

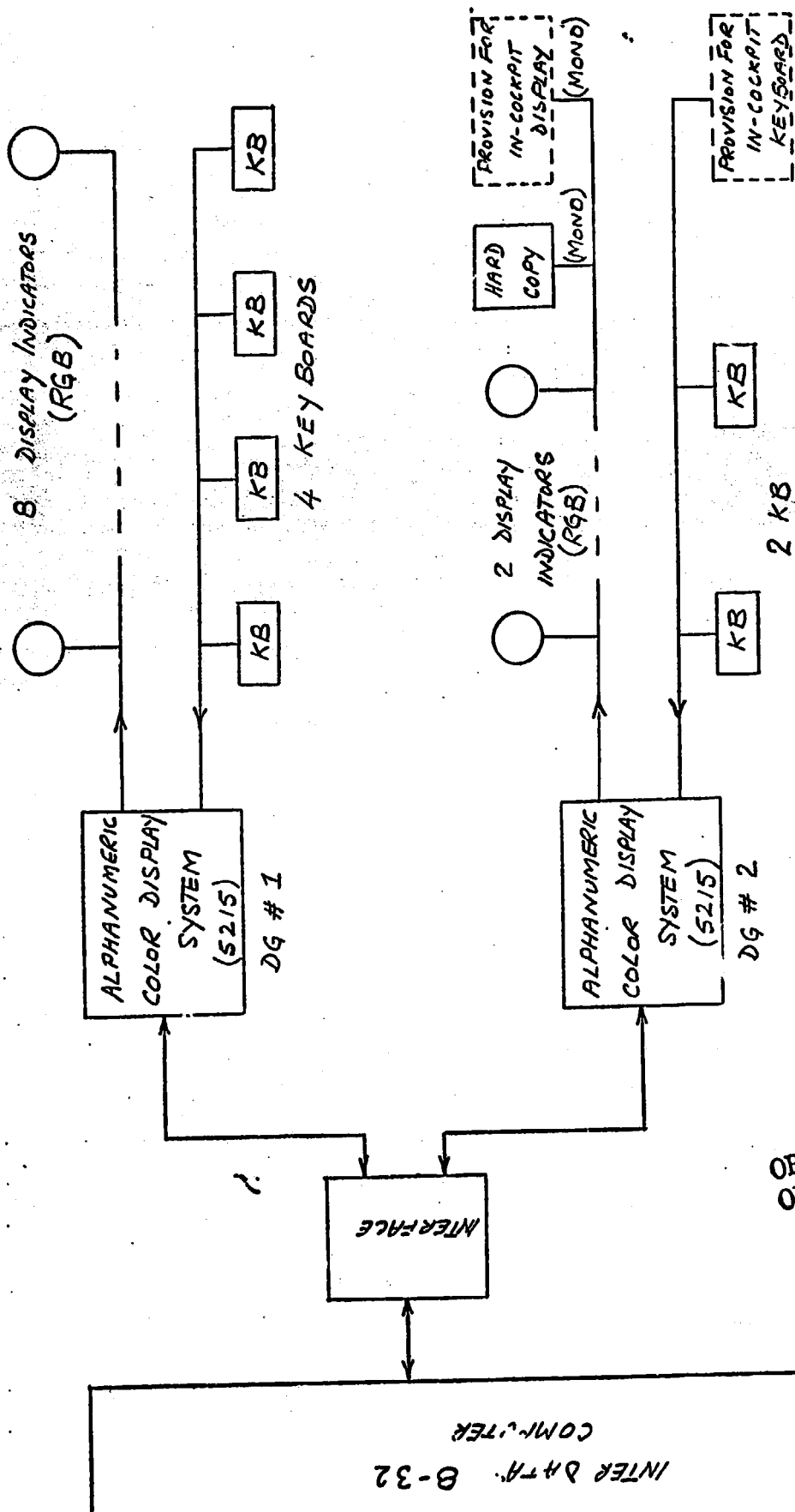


INTERACTIVE COLOR ALPHA-NUMERIC  
DISPLAY SYSTEM

CONFIGURATION #1 (FIXED BASE INSTN)

FIGURE 3-1

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INTERACTIVE COLOR ALPHA-NUMERIC  
DISPLAY SYSTEM

CONFIGURATION #2 (MOVING BASE INSTN)

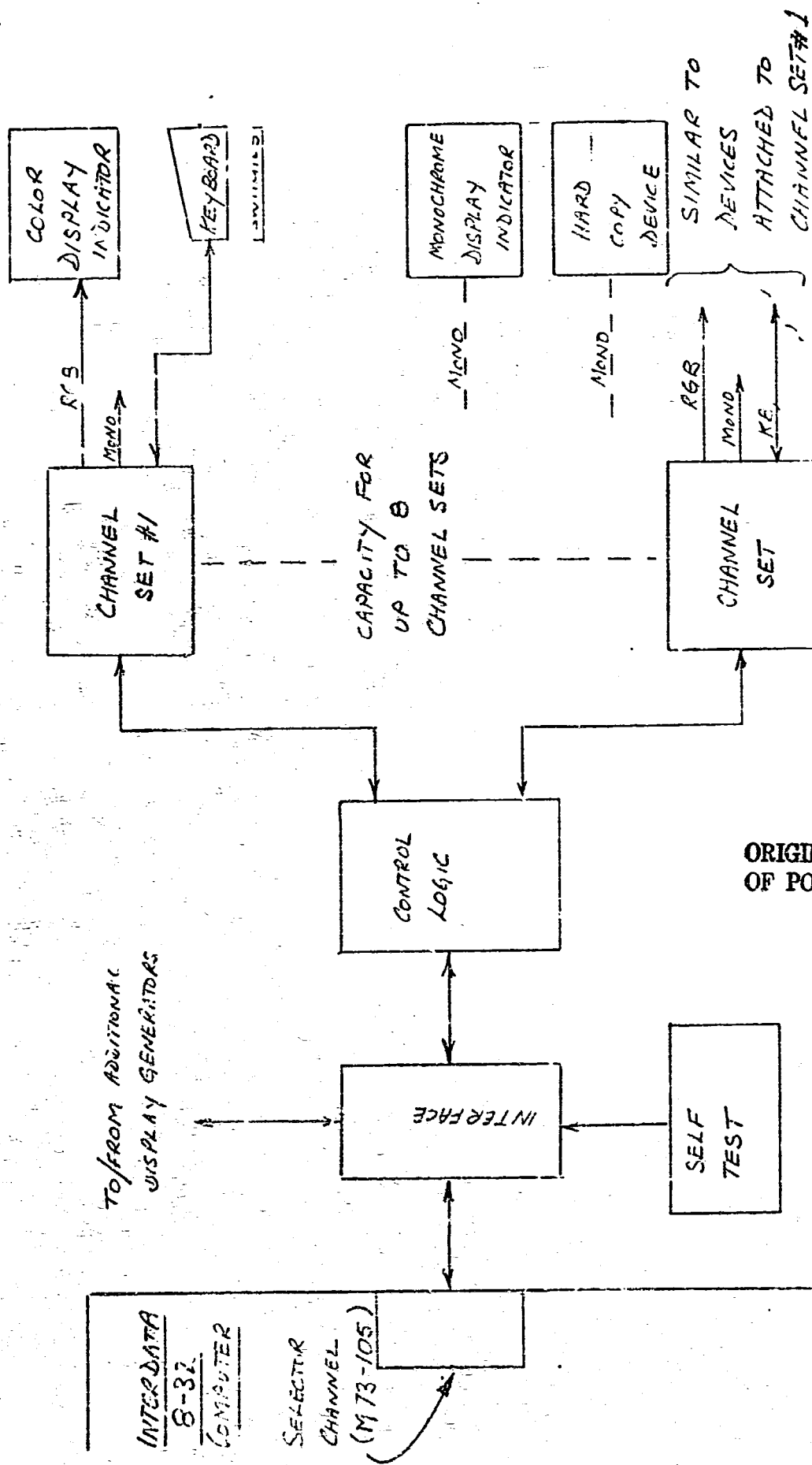
FIGURE 3-2

withstand the stresses of a moving base environment. The equipment components will be as shown by Figure 3.3.

#### 3.2-1.2.4 Color Alpha-Numeric Display System Definition

Each color alpha-numeric display system will be a commercially available set of equipment which will be used to present alpha-numeric characters and graphic symbols in various colors and visual presentations. The display system depicted by Figure 3-4 represents a typical system where alternate components necessary to provide a functioning set of hardware may be added. The following major components of the system will be provided.

- a) An interface to the computer will provide a two-way access between the computer and the display system.
- b) Control logic functions which will provide timing signals and data transfer control to and from the remainder of the display generation equipment. Timing signals will synchronize all I/O, internal data transfers, and video output operations. Data transfer control will provide for coordination of display writing, reading and editing of display contents as the result of communication codes transmitted over the interface.
- c) One to eight channel sets per display generator. Each channel set will be addressable as a separate video generation channel for communication purposes and will provide both composite



COLOR ALPHA-NUMERIC DISPLAY SYSTEM  
COMPONENT DESCRIPTION

FIGURE 3-4

video signals to a color and monochrome output channel. The channel sets will contain the communication codes required to describe the displayed image.

- d) Color display indicators accepting the output from each channel set to display the required presentation.
- e) Monochrome display indicators which will accept the monochrome video output representative of the required presentation.
- f) Keyboards complete with illuminated function keys which will allow the operating personnel to interact with the display and computer.
- g) A self-test unit will be supplied as an integral part of the color alpha-numeric display system to allow off-line test and verification of the display generation hardware.
- h) A hard copy device will provide a monochrome image of any display presentation.

### 3.2.2 Panel Page Display

Display of a particular panel page is done by calling the appropriate CRT thru the CRT SELECTION panel on the ISA, then indicating on the ISA the panel page to be displayed on that particular CRT. This shall give two stroke panel display capability. The same page can be displayed on any or all of the A/N CRT's.

### 3.2.3 Hard Copy

Hard copies of any CRT can be obtained by depressing

the desired CRT SELECTION switch then HARD COPY. This shall give two stroke hard copy capability of any CRT at the instructors' stations or operators' stations.

#### 3.2.4 Switches and Switch Lights

The ISA switches, as well as other Simulator Control switches, will be input into the computer through DI's except EMER STOP. Lighted push-button switches requiring program control will be lit by the use of LO's, one or two per switch depending on whether it is a single lens or split lens.

#### 3.2.5 Indicator and Console Lamps Control

##### 3.2.5.1 Indicator Lamp Intensity Control

Each instructor is provided with a control for dimming his respective half of the IS indicator lamps. Each half of the IS indicator lamps is powered by a separate programmable power supply. The instructor's control consists of a potentiometer which varies the output voltage of the respective programmable power supply. The output voltage in turn controls the indicator lamp intensity.

##### 3.2.5.2 Console Intensity

There are two console lamp intensity controls, one for each instructor. The console intensity control is a variable transformer which directly regulates the voltage level to the respective console lamps thereby regulating the lamp intensity.

##### 3.2.5.3 Lamp Test

There are four lamp test switches located at the instructor console. Each instructor has a left and right lamp test switch. This allows each instructor to test all the lamps

on both the left and right sides of his respective half of the IS. Each side of the IS is powered by a separate power supply and by separating each half into left and right sections the power drawn during a lamp test is only approximately half of that power supply's capability. The operator has a similar lamp test capability.

### 3.2.6 Recorders

Three 8-channel X-T recorders are provided as GFE. Each of the 24 channels will be connected to a corresponding AO channel. This will provide the ability to make X-T recordings of software parameters.

Two dual-pen Esterline Angus Model XYY' 540 recorders will be supplied. The 540 is a high-precision instrument that simultaneously plots two separate vertical (Y and Y' axis) input signals in relation to a single horizontal (X axis) signal. A plotted record or display may be drawn on 11 x 17-inch paper with pen crossings as required in two contrasting colors, typically red and green. Changing paper or pens is a quick and simple operation, because of features such as snap-fit fingertip pen automatic pen lift, and vacuum paper hold.

The plotter scale marking and range calibration will be in English units.

In operation, when the XYY' recorder is not in motion the pens may be lifted by remote control and event marks which appear as a trace deviation may be commanded.

The plotters will be mounted in castered cabinets and provided with a sufficiently long cable to allow flexibility in positioning.

The two-pen capability permits the recorders to be used in a variety of ways. For example, enroute or approach ground tracks on two successive runs of the same mission can be plotted to demonstrate improvement (or the lack of it). Alternately, one pen can be used to plot the ideal track, the other that made by the vehicle. One of the recorder axes can be made a time axis; in this mode each of the recorders can display the time history of two variables, or the history of one variable and its "ideal" history.

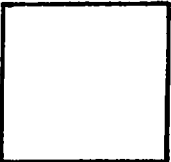

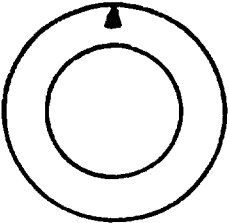
IDENTIFICATION	MANUFACTURER	FUNCTION	TYPE
	Stacoswitch 1139 Baker Street Costa Mesa, California 92626	Indicator Light	Series 40 4 Lamp capability allows for lamp redundancy. Lamps are removable from front without special tools. Lens housing will be silver color to distinguish from switch light. Also a split lens switch.
	Stachoswitch 1139 Baker Street Costa Mesa, California 92626	Switch Light	Series 40 4 Lamp capability allows for. Lamp redundancy. Lamps are removable from front without special tools. Lens housing will be black to distinguish from indicator light. Available with spring loaded clear cover to prevent inadvertent actuation.
	Raytheon Lexington, 02173	Rotary Control Knob for continuous adjustment	Series 70 Matte black with white arrow. Skirted to protect panel from finger smudges.

Table 3.1-1a Panel Hardware

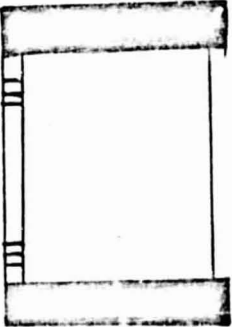
IDENTIFICATION	MANUFACTURER	FUNCTION	TYPE
	<p>Master Specialties 1640 Monrovia Ave. Costa Mesa, 92627 California</p>	<p>Large Switch Light</p>	<p>Series 10E Twist-Lite. Protective, spring loaded, clear cover to prevent inadvertent actuation. Black barriers. Lamps are removable from front without special tools. &amp; lamp capability allows for lamp redundancy.</p>

Table 3.1-1b Panel Hardware

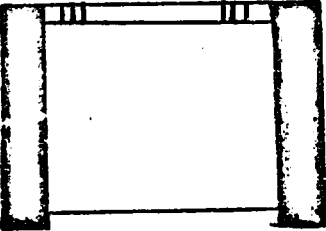
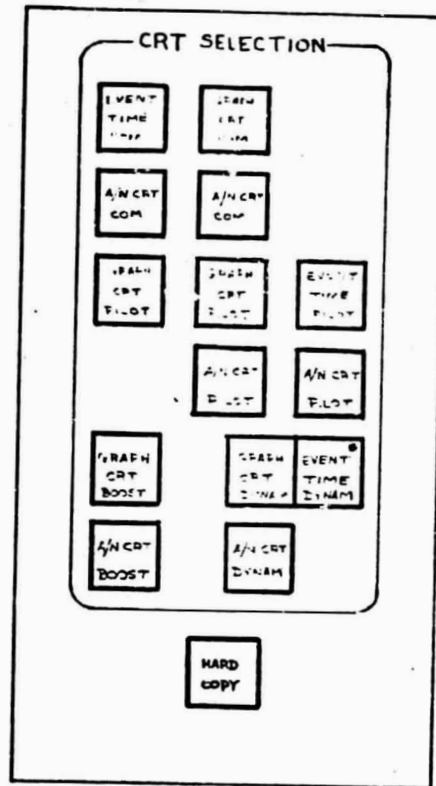
IDENTIFICATION	MANUFACTURER	FUNCTION	TYPE
	Master Specialties 1640 Monrovia Ave. Costa Mesa, California 92627	Large Switch Light	Series 10E Twist-Lite. Protective, spring loaded, clear cover to prevent inadvertent actuation. Black barriers. Lamps are removable from front without special tools. & lamp capability allows for lamp redundancy.

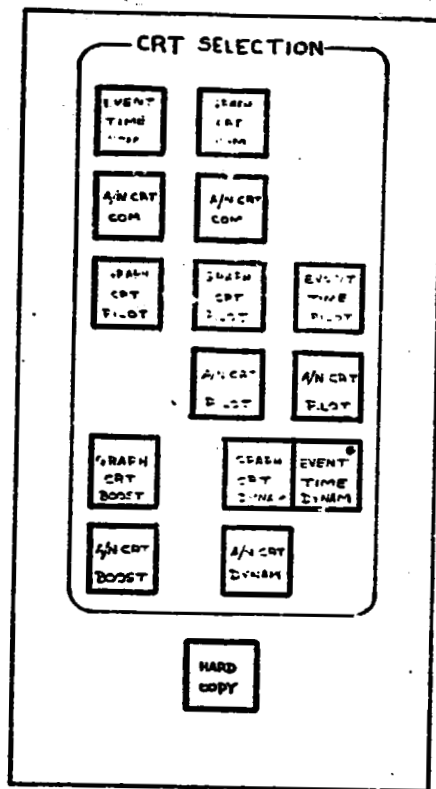
Table 3.1-1b Panel Hardware



\* FBIS ONLY

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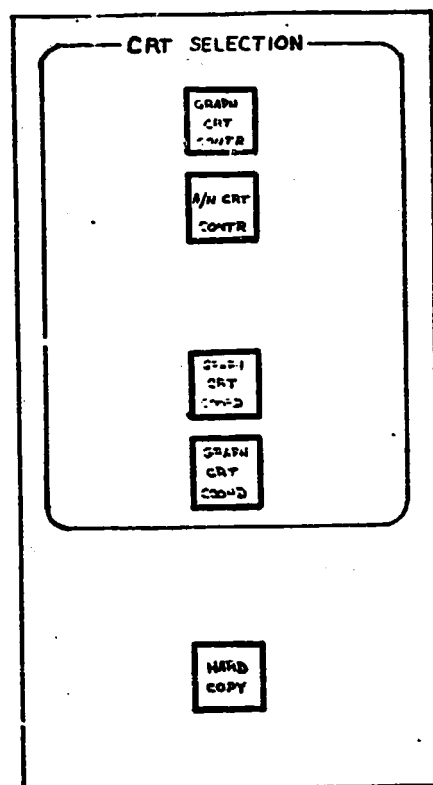
FIGURE 3.1-11 INSTRUCTORS' STATIONS  
CRT SELECTION



# FBIS ONLY

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FIGURE 3.1-11 INSTRUCTORS' STATIONS  
CRT SELECTION



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FIGURE 3.1-12 OPERATORS' STATIONS  
CRT SELECTION

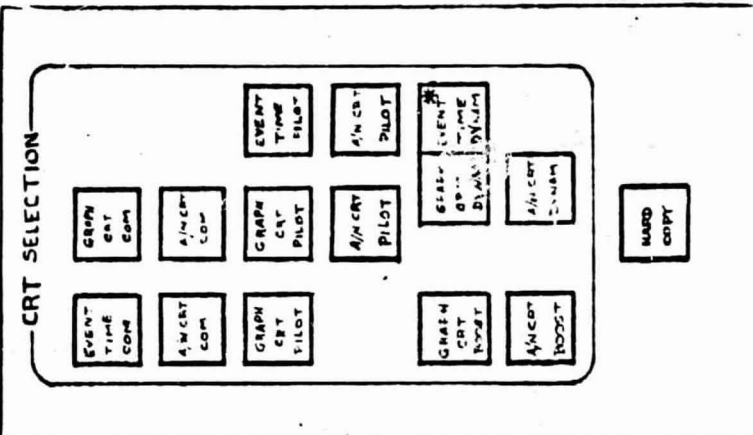
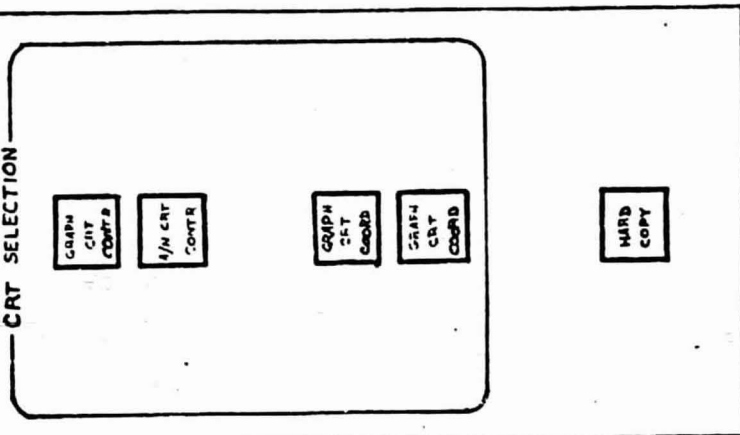
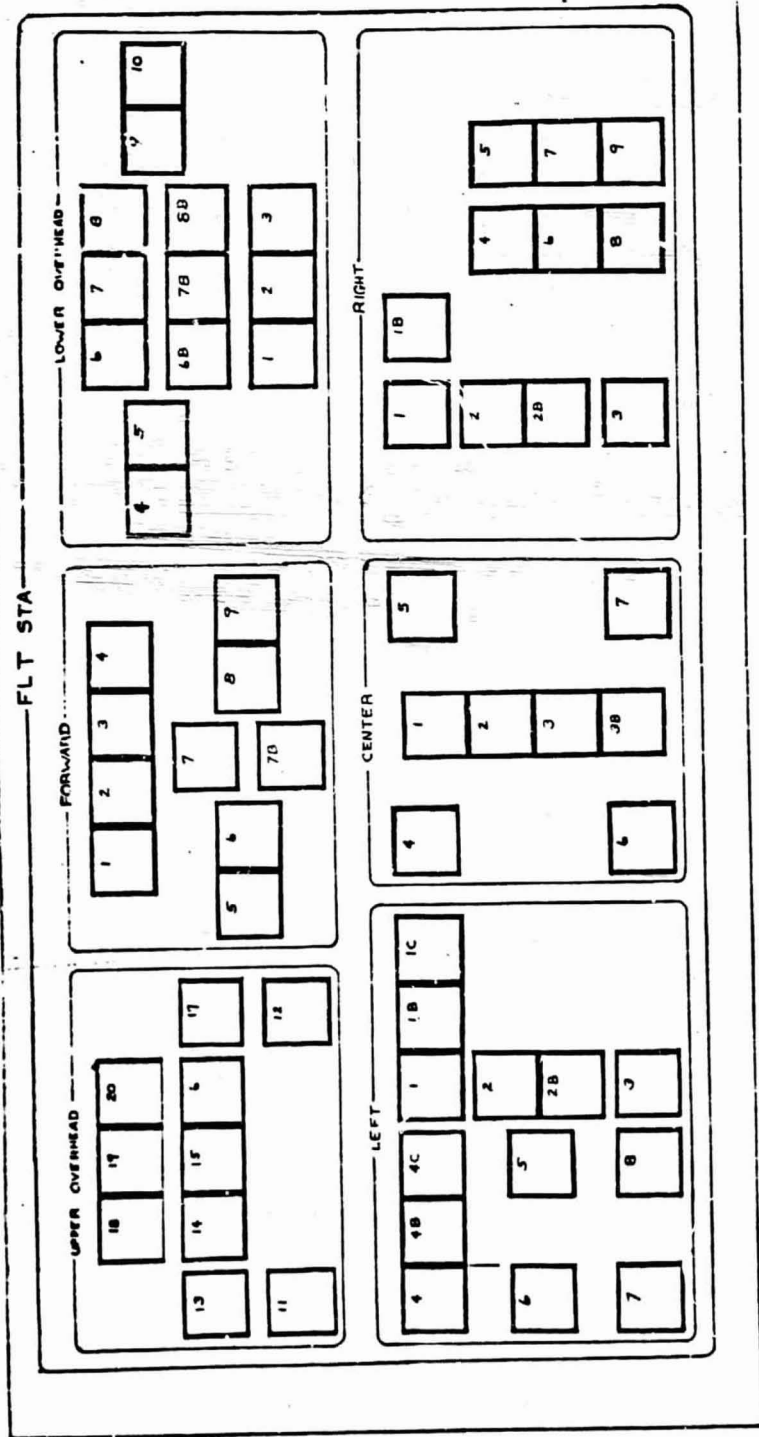


FIGURE 3.1-13a ISA AND CRT SELECTION PANELS

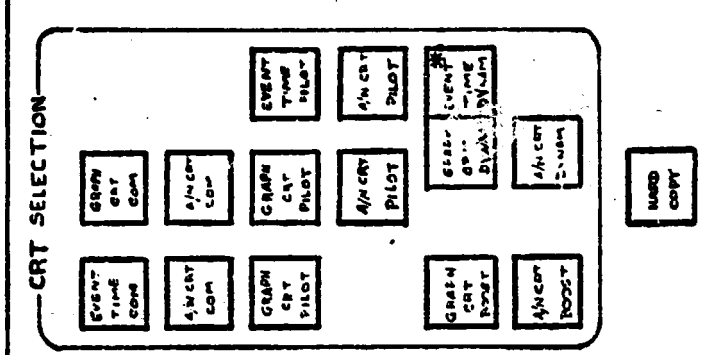
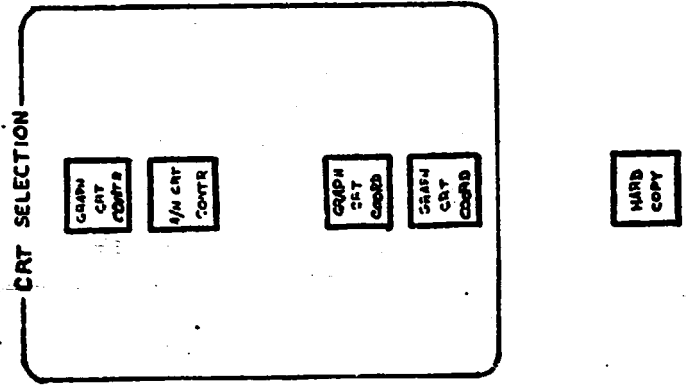
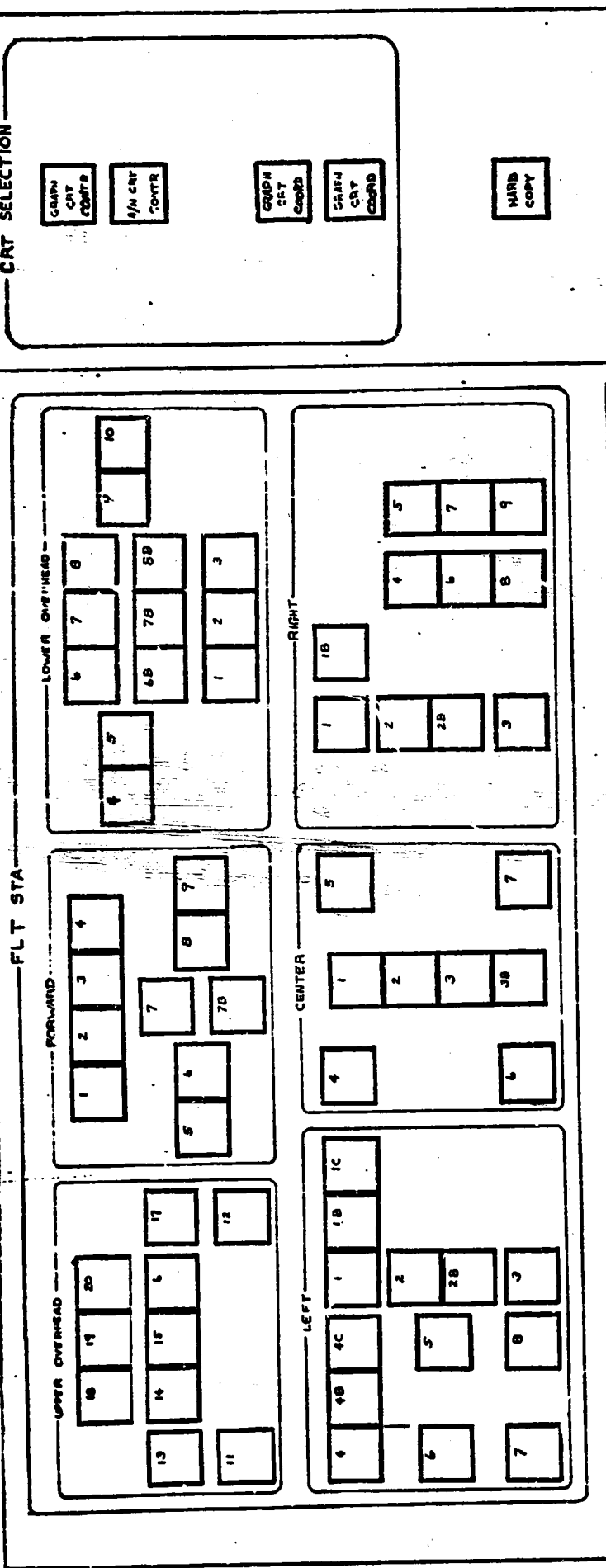


FIGURE 3.1-13a ISA AND CRT SELECTION PANELS

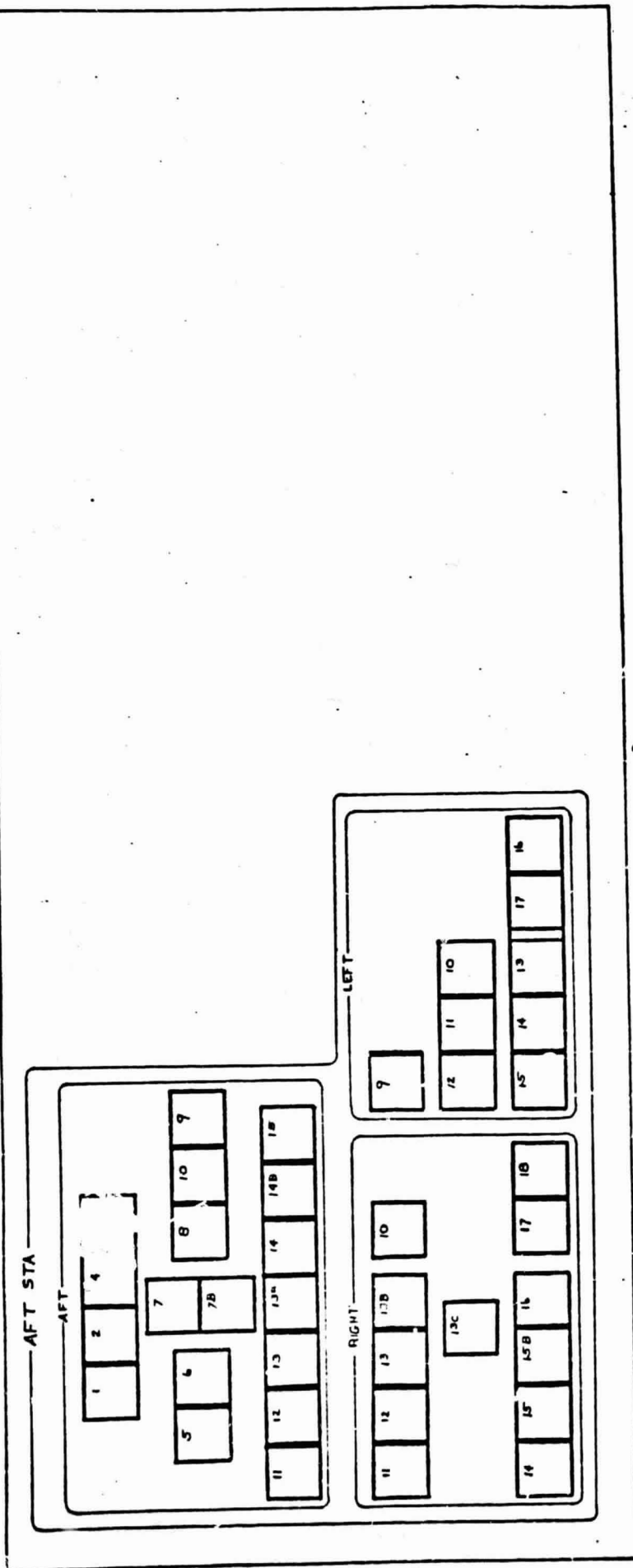


FIGURE 3.1-13. ISA AND CRT PANELS

**ATTACHMENT I**  
**FUNCTIONAL LIST**  
**(NOT INCLUDED)**

ATTACHMENT II  
PANEL SKETCHES

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**CRT SELECTION**

EVENT TIME COM	ANALYST COM	GRAPH CRT PILOT	EVENT TIME PILOT	ANALYST PILOT	GRAPH CRT PILOT	ANALYST COM	ANALYST PILOT	ANALYST COM	ANALYST PILOT
ANALYST COM	ANALYST COM	ANALYST PILOT	ANALYST PILOT	ANALYST PILOT	ANALYST PILOT	ANALYST PILOT	ANALYST PILOT	ANALYST PILOT	ANALYST PILOT

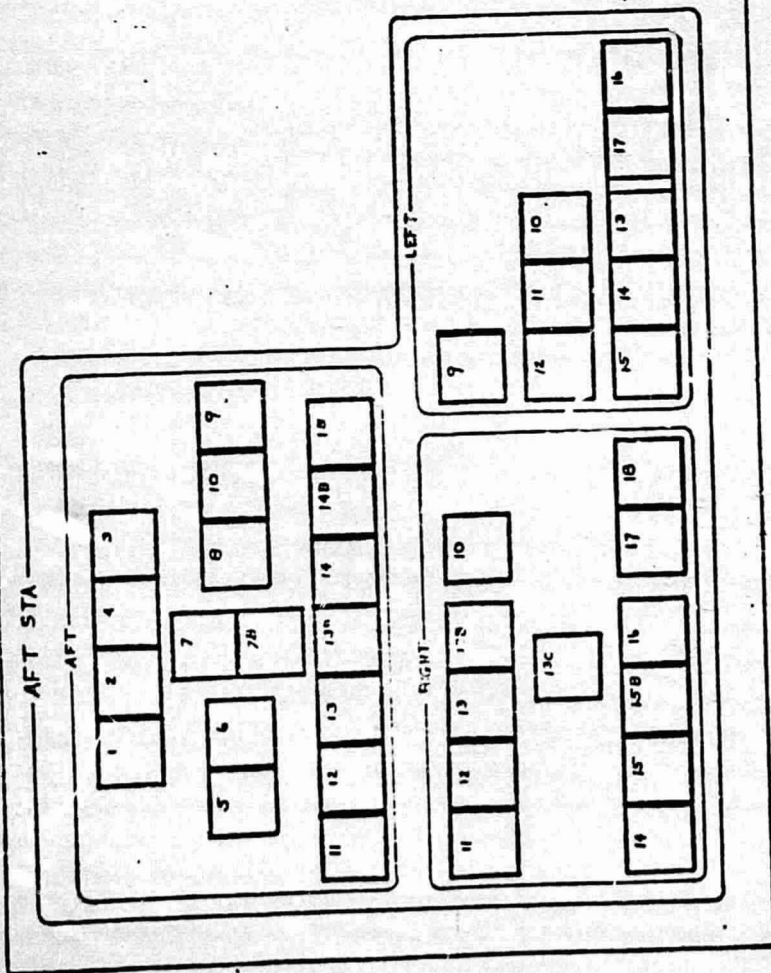
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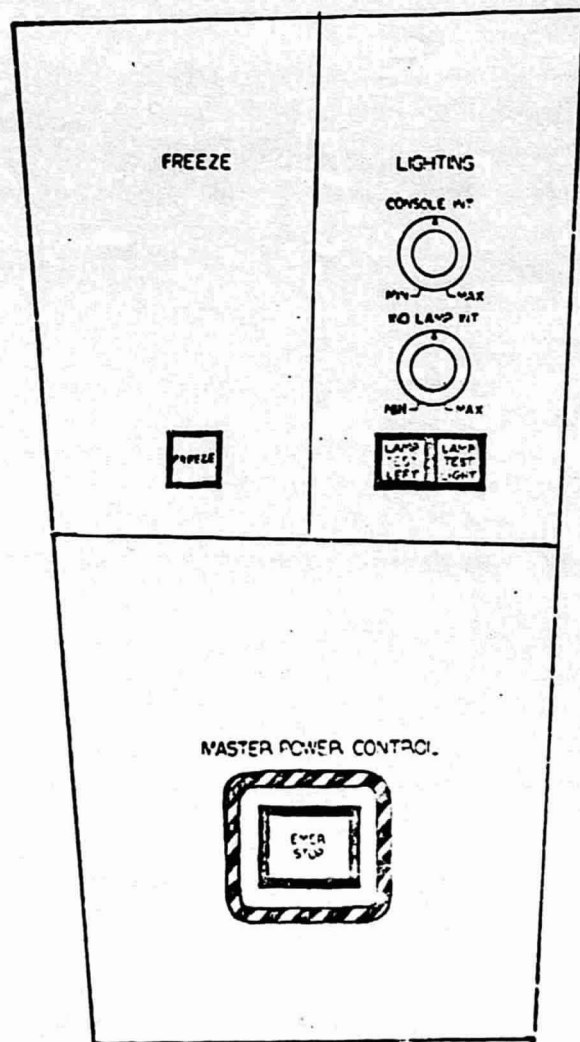
<p><b>UPPER OVERHEAD</b></p> <table border="1"> <tr> <td>18</td> <td>19</td> <td>20</td> </tr> <tr> <td>13</td> <td>14</td> <td>15</td> </tr> <tr> <td>16</td> <td>17</td> <td>12</td> </tr> </table>	18	19	20	13	14	15	16	17	12	<p><b>FORWARD</b></p> <table border="1"> <tr> <td>1</td> <td>2</td> <td>4</td> </tr> <tr> <td>5</td> <td>6</td> <td>7</td> </tr> <tr> <td>8</td> <td>9</td> <td>7B</td> </tr> </table>	1	2	4	5	6	7	8	9	7B	<p><b>LOWER OVERHEAD</b></p> <table border="1"> <tr> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>6B</td> <td>7D</td> <td>5D</td> </tr> <tr> <td>1</td> <td>2</td> <td>3</td> </tr> </table>	6	7	8	6B	7D	5D	1	2	3											
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PANEL 1C

C.4



PANEE 2C



PANEL 3C

<b>MAJOR EQUIP STATUS</b>  <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">VIS AVAIL</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">MOTION AVAIL</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">LIVE ON</div> <div style="border: 1px solid black; padding: 2px;">SIM POWER ON</div>	<b>VISUAL SYS STATUS</b>  <div style="border: 1px solid black; padding: 2px; float: right;">OPER IN RST</div>	
<b>SIM MODE STATUS</b>  <div style="border: 1px solid black; padding: 2px; margin-top: 20px;">IS ACTIVE</div>	<b>SIMULATOR CONTROL STATUS</b>  <div style="border: 1px solid black; padding: 2px; margin-top: 20px;"> <div style="display: inline-block; width: 40px;">RESLT IN PROG</div> <div style="display: inline-block; width: 40px;">FREEZE</div> </div>	

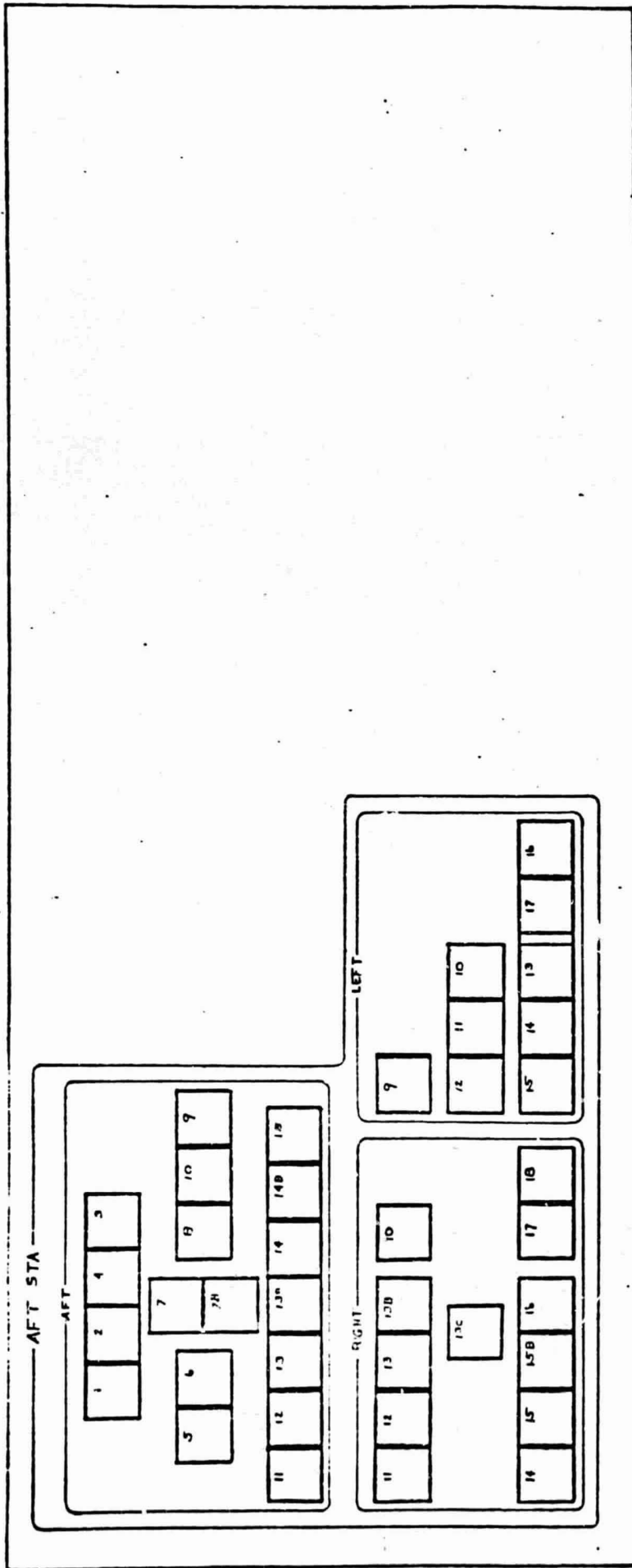
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OPS	1	2	3
SPEC	4	5	6
EMUL	7	8	9
TRM	-	0	-
ENTER	STEP	.	CLEAR
WLDW	DATA CENT		RECALL
EXEC			PRO

PANEL 4 C

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PANEL TC



PANEL 8C

**CRT SELECTION**

VIEW TIME COM	GRAPH CR COM	A/CRT COM	GRAPH CR PILOT	EVENT TIME PILOT
GRAPH CR PILOT	A/CRT PILOT	A/CRT PILOT	GRAPH CR PILOT	A/CRT PILOT
GRAPH CR PILOT	A/CRT PILOT	A/CRT PILOT	GRAPH CR PILOT	A/CRT PILOT
GRAPH CR PILOT	A/CRT PILOT	A/CRT PILOT	GRAPH CR PILOT	A/CRT PILOT

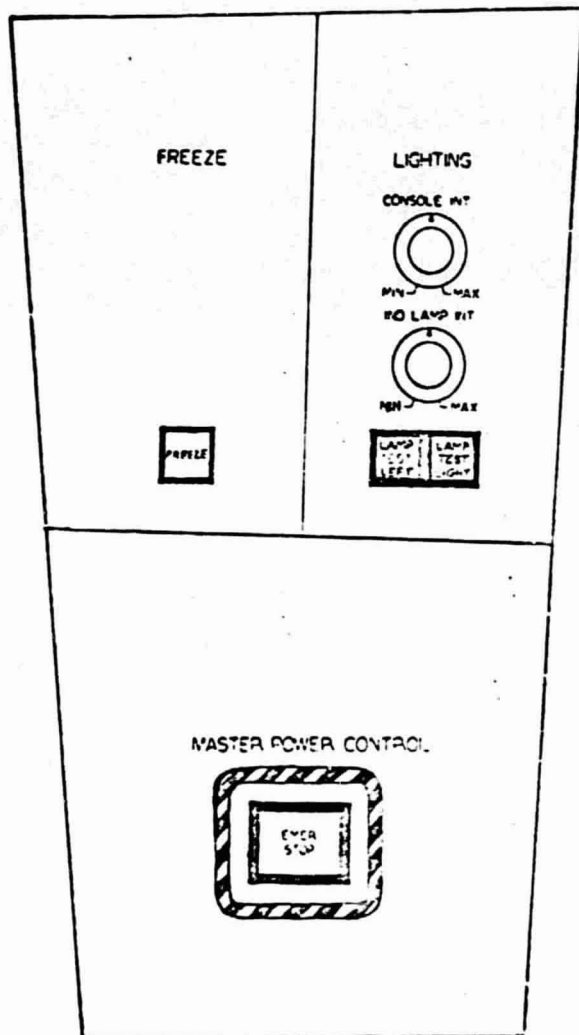
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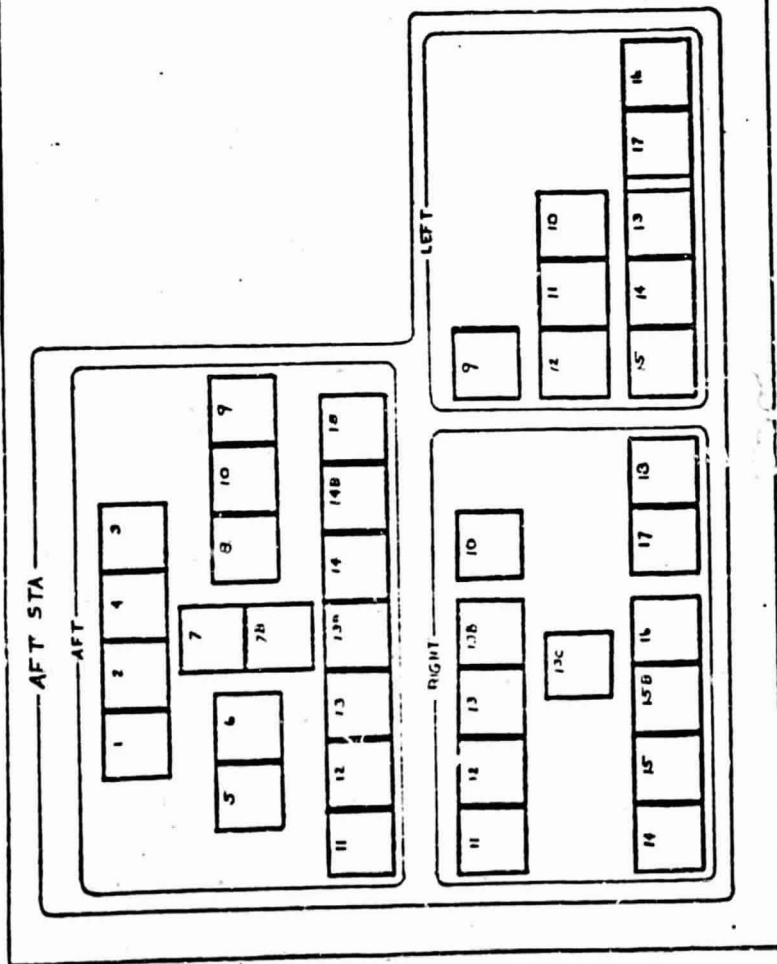
UPPER OVERHEAD	FORWARD	LOWER OVERHEAD
18 17 20	1 2 3 4	6 7 8
13 14 15 16 17	5 6 7 8 9	10
11	10	

LEFT	CENTER	RIGHT
4 4B 4C 1 1B 1C	1 2 3 4B	1B
6 5 8	5 6 7	2 2B 3
7		4 5 6 7 8 9

PANEL 11C







PANEL 12C



PANEL 13C

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LIGHTING	AURAL CUE	VISUAL SYSTEM STATUS	SIMULATOR STATUS																													
<p>CONSOLE INT</p> <p>MIN  MAX</p> <p>IUB LAMP INT</p> <p>MIN  MAX</p> <p> <input type="checkbox"/> LAMP TEST LEFT  <input type="checkbox"/> LAMP TEST RIGHT         </p>	<p>AURAL VOLUME</p> <p>MIN  MAX</p> <p> <input type="checkbox"/> AURAL ON         </p> <p>WARN VOLUME</p> <p>MIN  MAX</p> <p> <input type="checkbox"/> WARN ON         </p>	<p>DC POWER ON</p> <table border="1"> <tr> <td>VIS POWER CAB</td> <td>GANTRY CONTROL CAB</td> <td>CAMERA CAB</td> <td>IMSN CAB</td> <td>DISPL POWER CAB #1</td> <td>DISPL POWER CAB #2</td> </tr> </table> <p>OVERHEAT</p> <table border="1"> <tr> <td>VIS POWER CAB</td> <td>GANTRY CONTROL CAB</td> <td>CAMERA CAB</td> <td>IMSN CAB</td> <td>DISPL POWER CAB #1</td> <td>DISPL POWER CAB #2</td> <td>MODE ILLUM</td> <td>BELL OFF</td> </tr> </table> <p> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p>           MAINT SEL:           <table border="1"> <tr> <td>GANTRY CONTROL CAB</td> <td>CAMERA CAB</td> <td>IMSN CAB</td> </tr> </table>           GANTRY STAT:           <table border="1"> <tr> <td>OVER SPEED</td> <td>GANTRY IN LIMIT</td> <td>PROB BRO-TEST</td> </tr> </table> </p>	VIS POWER CAB	GANTRY CONTROL CAB	CAMERA CAB	IMSN CAB	DISPL POWER CAB #1	DISPL POWER CAB #2	VIS POWER CAB	GANTRY CONTROL CAB	CAMERA CAB	IMSN CAB	DISPL POWER CAB #1	DISPL POWER CAB #2	MODE ILLUM	BELL OFF	GANTRY CONTROL CAB	CAMERA CAB	IMSN CAB	OVER SPEED	GANTRY IN LIMIT	PROB BRO-TEST	<p>OVERHEAT</p> <table border="1"> <tr> <td>BELL OFF</td> <td>CS BLEED OFF</td> <td>IS FLOW IN</td> <td>OIL W STA</td> <td>INSTA STA</td> <td>CHW ST.</td> <td>POU</td> <td>ICU</td> <td>SID</td> </tr> </table>	BELL OFF	CS BLEED OFF	IS FLOW IN	OIL W STA	INSTA STA	CHW ST.	POU	ICU	SID
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BELL OFF	CS BLEED OFF	IS FLOW IN	OIL W STA	INSTA STA	CHW ST.	POU	ICU	SID																								

PANEL 21C

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		<b>VISUAL SYSTEM</b>  <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px; text-align: center;"> <div style="border: 1px solid black; width: 15px; height: 15px; display: inline-block;"></div> <div style="display: inline-block; text-align: left;">VIS AVAIL</div> </div> <div style="border: 1px solid black; padding: 2px; text-align: center;"> <div style="border: 1px solid black; width: 15px; height: 15px; display: inline-block;"></div> <div style="display: inline-block; text-align: left;">OPER RST</div> </div> </div>			
<b>SIMULATOR MODE</b>  <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px; text-align: center;">IS ACTIVE</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">OBS CONT</div> </div>		<b>SIMULATOR CONTROL</b>  <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px; text-align: center;">RUN</div> <div style="border: 1px solid black; padding: 2px; text-align: center;"> <div style="border: 1px solid black; width: 15px; height: 15px; display: inline-block;"></div> <div style="display: inline-block; text-align: left;">RESET IN PROG</div> </div> <div style="border: 1px solid black; padding: 2px; text-align: center;"> <div style="border: 1px solid black; width: 15px; height: 15px; display: inline-block;"></div> <div style="display: inline-block; text-align: left;">FREEZE</div> </div> </div>			
				<b>MASTER POWER CONTROL</b>  <div style="border: 2px solid black; padding: 10px; text-align: center;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> <div style="display: inline-block; text-align: left;">EMER STOP</div> </div> </div>	

PANEL 22C

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**CAT SELECTION**

GRAPH CAT COORD	1/4 CAT COORD	GRAPH CAT COORD	GRAPH CAT COORD	GRAPH CAT COORD
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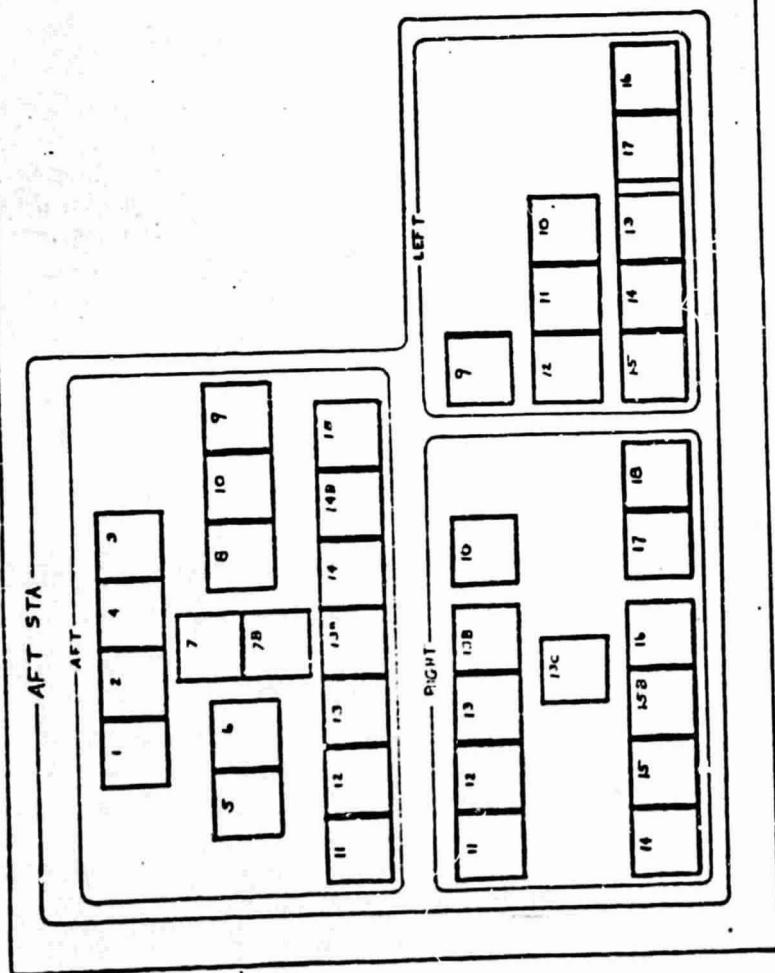
WIND  
COPY

**FLT STA**

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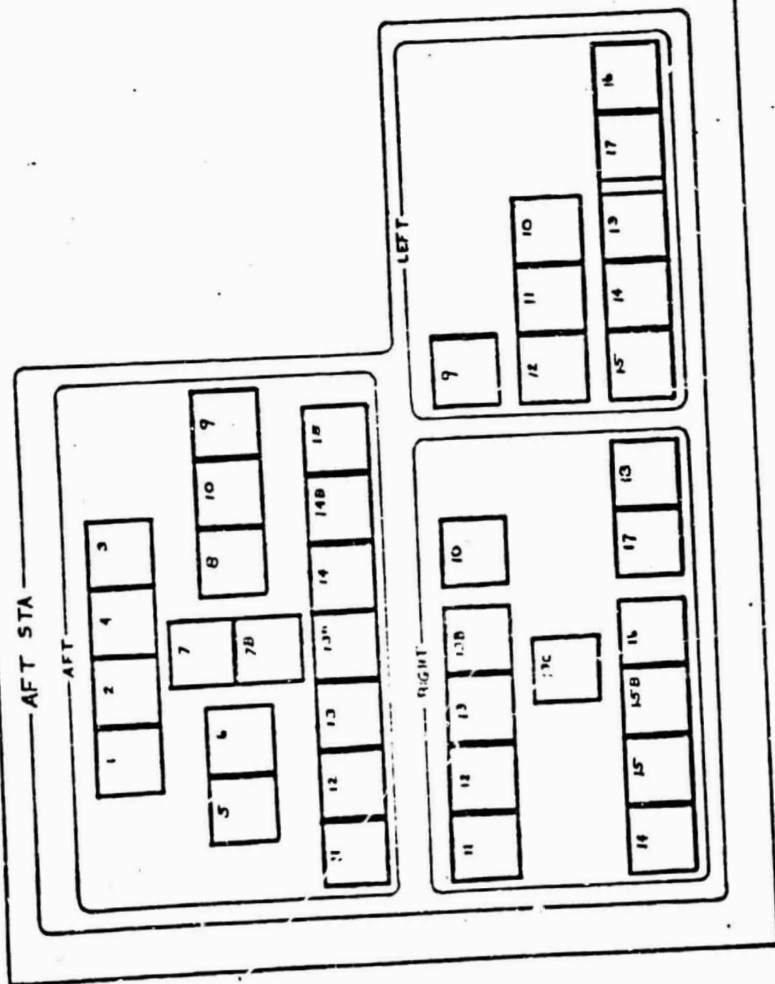
PANEL 23C

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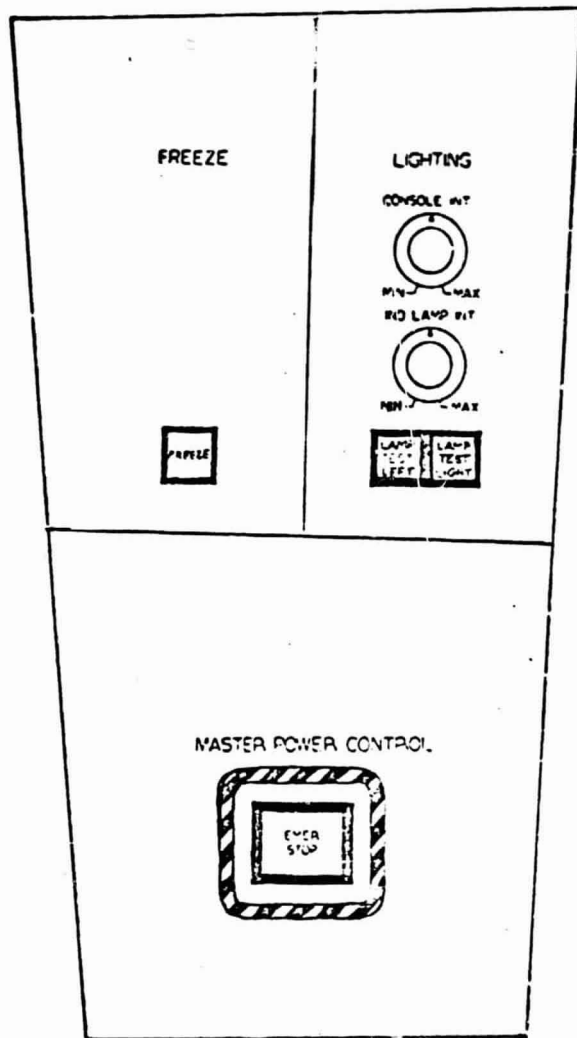
PANEL 24C





PANEL 2 F

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PANEL 3 F

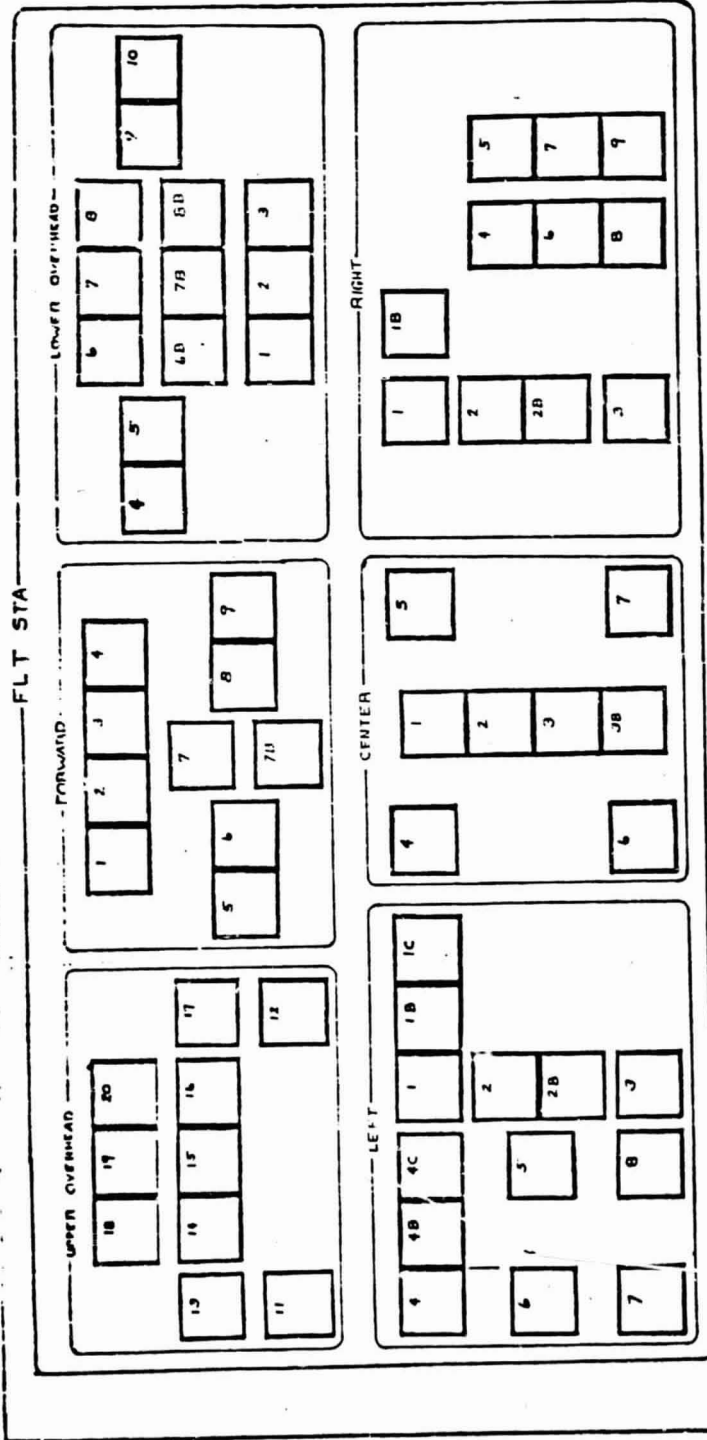
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VIS AVAIL															
MOTION AVAIL															
LUCKY ON															
SIM POWER ON															
THROW CUT OUT	RAMP	DOOR	MAINT												
MOTION ON	EXT PITCH	MOTION OFF													
OPER															
IN RST															
<p>SIM MODE STATUS</p> <table border="1"> <tr> <td>IS ALIVE</td> </tr> </table>	IS ALIVE	<p>SIMULATOR CONTROL STATUS</p> <table border="1"> <tr> <td>RESET IN PROG</td> <td>FREZZE</td> </tr> </table>	RESET IN PROG	FREZZE											
IS ALIVE															
RESET IN PROG	FREZZE														

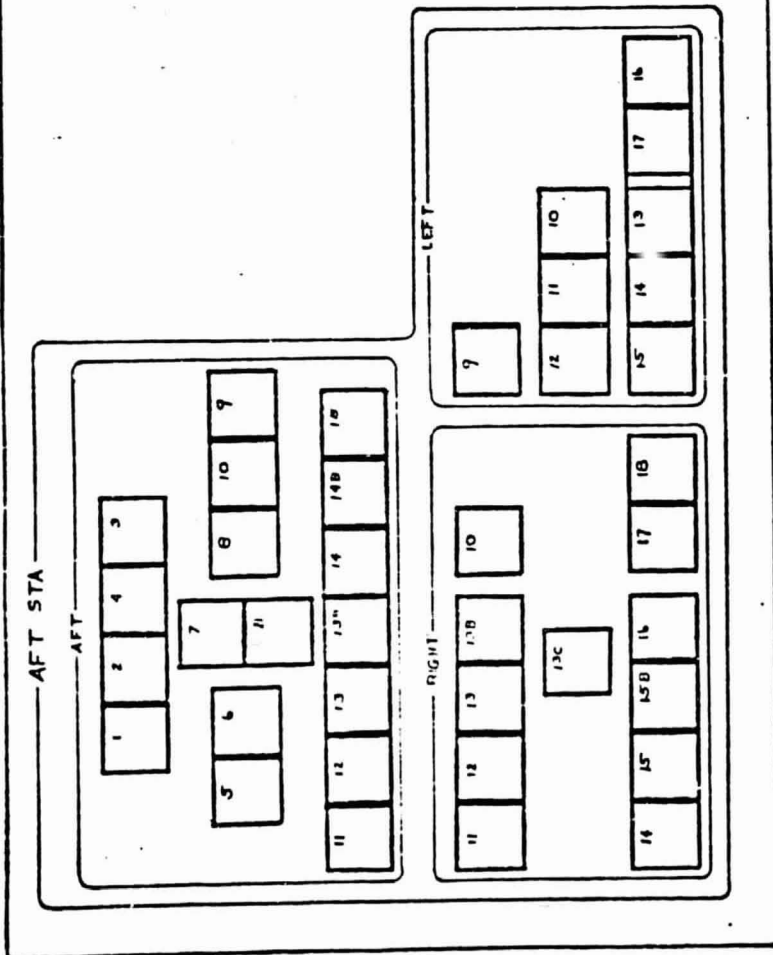
FAIL	W30 PL SET		ACA
OPS	1	2	3
SPEC	4	5	6
ESCAL	7	8	9
"EM	=	0	=
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PLANE	DATA FEED		RECALL
EXEC			PROG

PANEL 4 F

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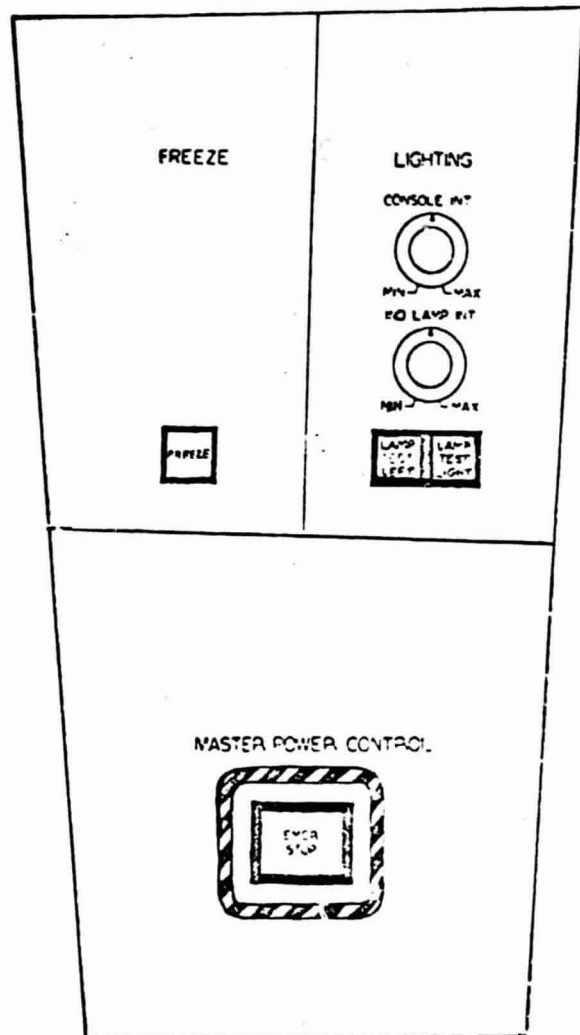


PANEL 7F



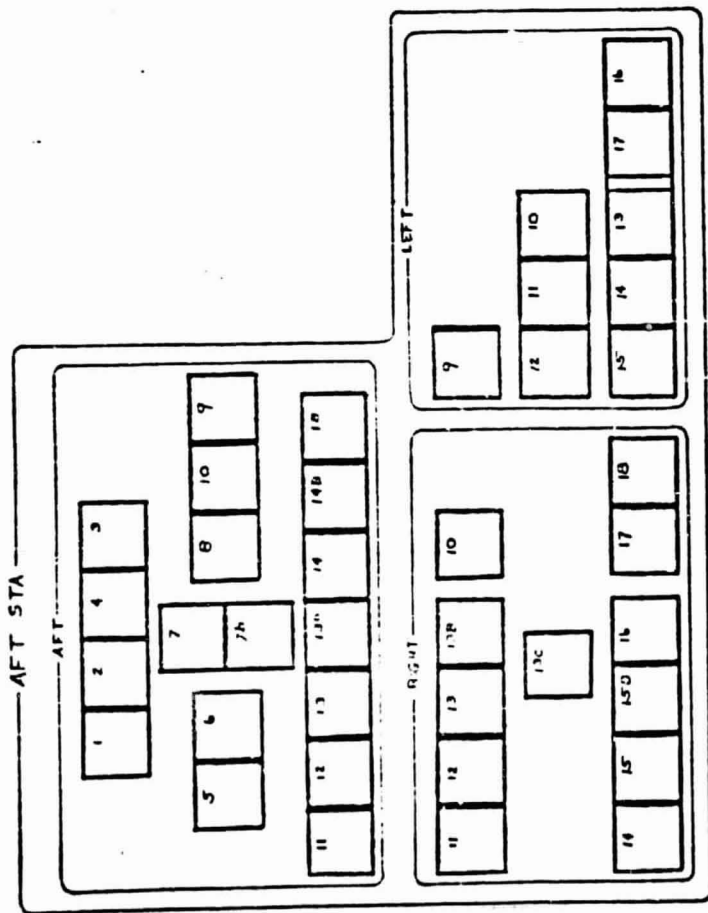
PANEL 8F





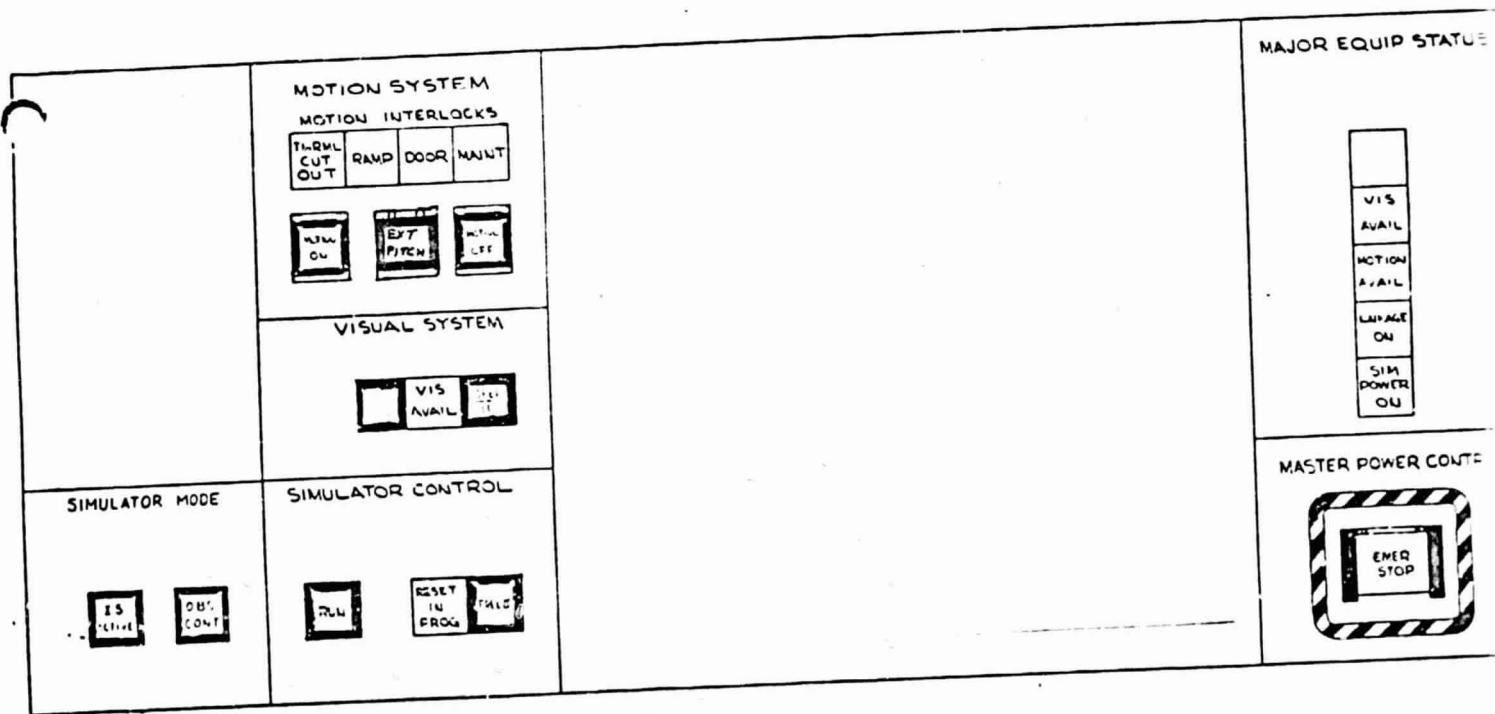
PANEL 12 F

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PANEL 13F



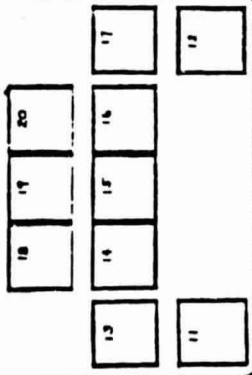


PANEL 22 F

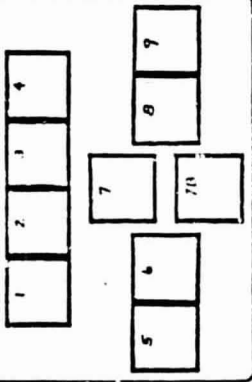
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# FLT STA

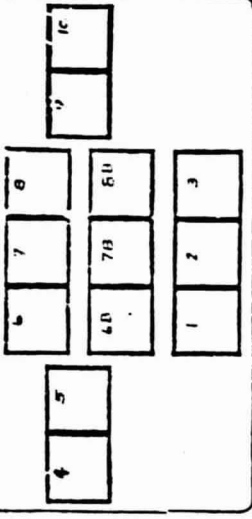
UPPER OVERHEAD



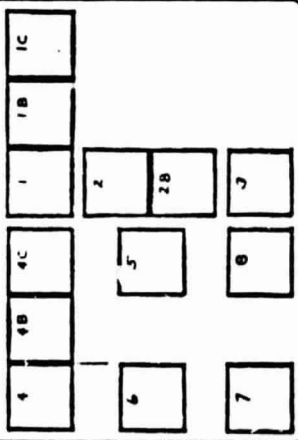
FORWARD



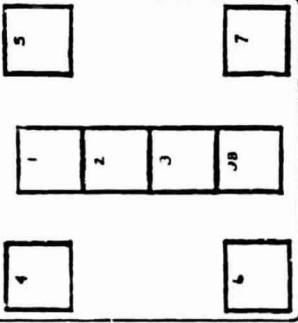
LOWER OVERHEAD



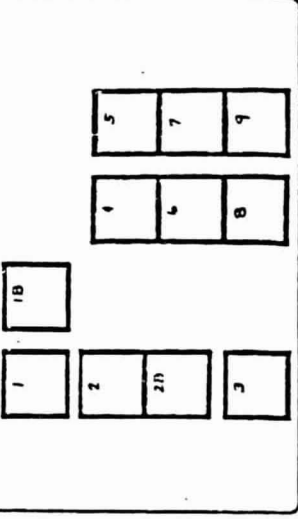
LEFT



CENTER



RIGHT



## CRT SELECTION

GRAPH CRT COORD

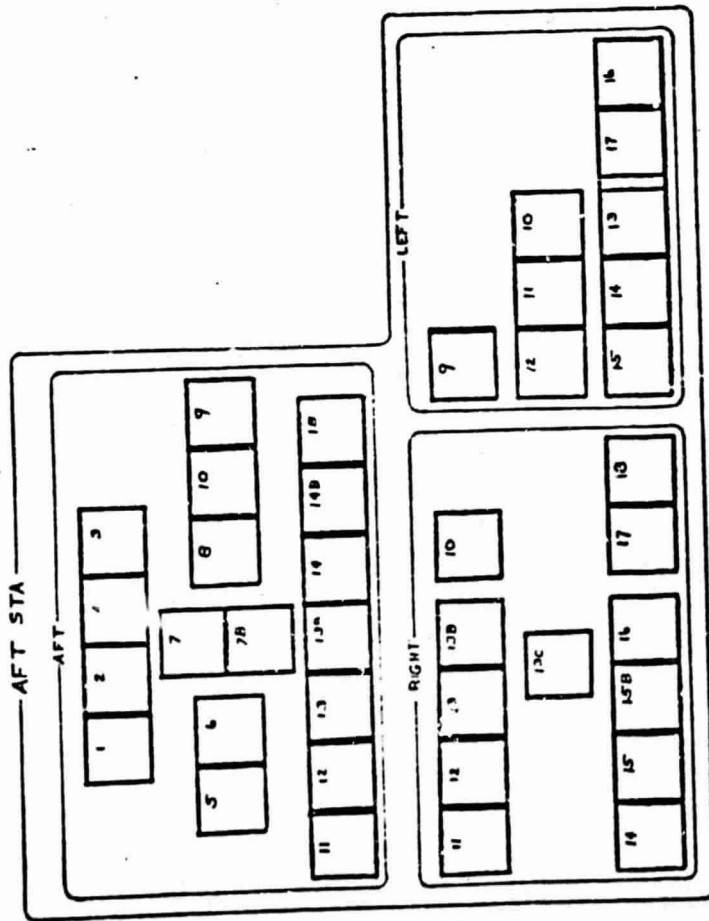
1/4 CRT COORD

GRAPH CRT COORD

GRAPH CRT COORD

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PANEL 23 F



PANEL 24 F.

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"SMS-EDR"

IDENTIFYING  
INCREMENTAL SECTION  
RELEASE SHEET

The following is part of Section 24, WP #24.

Subsection(s):

- A. Simulator and Computer Power and Grounding
- B. Visual Power and Grounding (Not included).

ENGINEERING DESIGN REPORT  
POWER AND GROUNDING

A. SIMULATOR AND COMPUTER POWER AND GROUNDING

1.0 SUMMARY

The Simulator and Computer Power and Grounding System includes the distribution and modification of the facility power by the Power Distribution Unit (PDU). The PDU will control and distribute power to all SMS units except Visual and Air Conditioning. The PDU will also be the termination of the grounding system.

2.0 SCOPE

This report will explain the concepts behind the SMS Simulator and Computer Power and Grounding System design.

3.0 DESIGN CRITERIA

The general areas of consideration in this design are:

- a) SMS Power Requirements
- b) PDU
- c) 400Hz
- d) System Grounds
- e) Emergency Off
- f) Overheat and Warning
- g) Power Distribution

4.0 DESIGN IMPLEMENTATION

4.1 SMS POWER REQUIREMENTS

The SMS Complex shall be supplied electrical power from the Building 5 Mission Simulation Facility through disconnects.

4.1.1 The Facility disconnect will furnish 3Ø 120/208 VAC 60Hz fused 100 Amp/Phase to the PDU through four (4) 500 MCM wires including neutral. (Figure 4.1.1)

4.1.2 Power required for the FBCS and MBCS air conditioner heaters and the MBCS List Platform will be a facility furnished disconnect, with three (3) separate 3Ø 277/480 VAC 60 Hz circuit breakers at 20 Amp/Phase for a total of 60 Amp/Phase.

(Figure 4.1.2)

4.1.3 Single Phase 400Hz 120 VAC will be Facility furnished. Two 10 Amp circuit breakers are required in the Facility disconnect box, one each for the FBCS and MBCS. (Figure 4.1.2)

#### 4.2 PDU

Power required for the FBCS, MBCS, and their associated IS, OS, SCE, Motion Control Cabinet (MBCS only) and Interdata equipment will be distributed from a centrally located PDU.

(Figure 4.1.1)

4.2.1 The PDU will include a power monitor panel (Figure 4.2.1), a card cage for control logic, a distribution panel, connectors for 60Hz and signal distribution, and a DC power supply for the control logic. Other DC power supplies will be installed at other locations where needed and controlled by switches located in the PDU.

4.2.2 Circuit breakers with remote trip coils will be used as part of the Emergency Off system. (Figure 4.5.1) Other circuit breakers will be installed in each branch circuit for systems power distribution. These breakers are part of the PDU.

4.2.3 The Utility outlets will be protected with individual 20 Amp circuit breakers. (Figure 4.1.1)

4.2.4 Contactors will be used throughout the system for control of the 60Hz power distribution. These will be controlled remotely by the switches that are part of the PDU monitor panel.

4.2.5 Connectors will be used exclusively to distribute the branch circuit 60Hz to the various user locations. These are Underwriters Listed but not Mil. approved, plastic type standard shell with a separate pin size selection. There is a cost saving in their use throughout the system.

4.2.6 Ribbon type connectors will be used to distribute control signals to the various sub-systems. The overheat and emergency off circuits will use part of the wires that are pre-assigned to these ribbon connectors.

4.2.7 The card cage that contains the cards for the control logic will also double as an interface for the control of the various sub-systems. The ribbon type connectors will terminate on the backplane of the card cage. A keying system will be used for all connectors.

4.2.8 The power Monitor panel will have control switches, a running time meter with five (5) digits, a switch, voltmeter combination to monitor 60Hz 120/208V, and a Phase light.

4.2.9 A piezo-crystal warning device with a pulsed 2400 Hz tone will be activated when the power mode manual switch (Figure 4.2.1) is pressed. This is a safety feature to warn that 60Hz power is about to be distributed to the sub-systems.

This momentary switch must be held approximately 5 seconds before the system ON switch is actuated.

4.2.9.1 This same warning device is used after initial power turn on as an overheat warning. (Figure 4.6.1.1)

#### 4.3 400 Hz

The Peripheral cabinet will accept the 400Hz 120 VAC straight from the Facility disconnect box. Control of the 400Hz will be inter-locked with the DC power. No separate control will be provided except for circuit breakers in the Peripheral cabinet.

4.3.1 The Emergency Off switch also controls the 400Hz because it is inter-locked with the DC power where it is being used.

4.3.2 400Hz distribution to the FBCS and the MBCS will be from the Peripheral cabinets.

#### 4.4 SYSTEM GROUNDS

System grounds will terminate at busses installed in the PDU. (Figure 4.4.1)

4.4.1 Neutral 60Hz grounds will be in a cable combined with the branch circuit wires.

4.4.2 Chassis ground will be individual braids to the various cabinets, consoles and crew stations. All cabinets will have a chassis ground.

4.4.2.1 Interdata equipment will be supplied with single phase 3 wire power which includes a chassis ground. Where 3Ø 120/208 VAC

is required five wires will be used and this will include a chassis ground.

4.4.3 Signal ground will be individual braids to the various cabinets, consoles and the crew stations.

4.4.4 The 400Hz return connects to the PDU signal ground buss, with separate wires from each peripheral cabinet.

#### 4.5 EMERGENCY OFF

The Emergency Off system will be controlled by the logic card in the PDU. Each remote area will have a separate parallel input from a non-illuminated momentary normally open switch. (Figure 4.5.1)

4.5.1 Except as noted further, all simulator power to both FBCS and MBCS will be removed upon actuation of an EMER OFF switch, including power to the computers and the utility outlets. However, the control circuits at the PDU and their status lights including the simulator overheat indicators will still operate.

4.5.2 Emergency Switches at the Hydraulic control cabinet and the pump room will not be inter-locked with the other Emergency switches. These will only control the hydraulic systems.

4.5.2.1 The other Emergency switches located throughout the complex will, however, control all the power including the hydraulics.

4.5.3 The Visual Emergency switches will be inter-locked with the rest of the complex.

#### 4.6 OVERHEAT WARNING

The Overheat system will include heat sensors and indicators in areas that have power supplies or other heat producing equipment, excluding the Interdata equipment. Each sensor will be adjustable and have a normally open set of contacts. Equipment cabinet sensors will be set at 105° F. (Figure 4.6.1.2)

4.6.1 The PDU logic card will monitor the sensors, sound an aural warning (Par. 4.2.9.1) and cause a monitor at the Operator's console to light whenever overheat conditions exist. A switch will be provided to silence the aural warning device. A return to a normal temperature will reset the aural warning circuit. (Figure 4.6.1.1, 4.6.1.2)

#### 4.7 POWER DISTRIBUTION

60Hz power distribution will be a parallel system with circuit breakers installed in the PDU to protect all of the branch circuits. Contactors will be used to control the circuits. Some of these will be mounted in the PDU; others in an adjacent cabinet, the IS, OS and the Peripheral cabinets. (Figure 4.1.1)

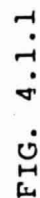
4.7.1 As a safety measure a lighted Maintenance switch will be installed at several locations that have DC power supplies. This switch will be connected to the PDU logic card and when operated will inhibit the 60Hz being supplied to that individual location. This alternate action lighted switch will be "Red" when in inhibit and "Green" otherwise.

4.7.2 The DC power will be individual supplies shared by the Interface circuit cards and the systems or instruments using the I/O signals.

4.7.2.1 Each location will be isolated from another by the use of the separate DC power and sub-controllers. This will eliminate ground loops and load current will be returned to the power supplies at each location.

4.7.2.2 Signal ground reference signals will be individual braids to the PDU. All ground references will be in a parallel fashion. (Figure 4.4.1)

\* INDICATES  
NOT MOUNTED IN  
FDU (SEE 4.7)



FACILITY SUPPLIED BOX  
AND CIRCUIT BREAKERS  
3  $\phi$  480/277V-60HZ (29KVA)

CB

NEUT.

20A

CB

NEUT.

20A

CB

NEUT.

20A

FACILITY SUPPLIED BOX  
1  $\phi$  120V 400HZ (2KVA)  
ISOLATED 2 WIRE AND  
WITH GND.

CB

10A

Lo

Hi

CB

10A

Lo

Hi

AIR CONDITIONER  
& HEATER, BLOWER  
FBCS

FBCS

THERMOSTAT

AIR CONDITIONER  
& HEATER, BLOWER  
MBCS

MBCS

THERMOSTAT

MBCS

LIFT PLATFORM

PERIPHERAL  
CABINET  
FBCS

PERIPHERAL  
CABINET  
MBCS

SMS FACILITY  
SUPPLIED AIR COND.  
LIFT PLATFORM AND  
400HZ POWER

FIG. 4.1.2

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# SMS PDU SYSTEM STATUS INDICATORS AND CONTROL SWITCHES.

## PART OF PDU CONTROL

### PANEL ON THE DOOR.

NOTE:  
ALL SHOWN ARE

SWITCHES WITH LEGENDS.

NORMAL	(SPARE)	MANUAL	SYSTEM ON	
			ON	OFF

TELEMETRY & MASTER CONTROL	FB CPU'S	MB CPU'S	FB OS	FB IS	FB SID	FB DISC. & PERIP.	(SPARE)	(SPARE)
OFF	OFF	OFF	OFF	OFF	OFF	OFF	(SPARE)	(SPARE)

(SPARE)	FB PERIP. CABINET	IBCS & SCE	MB OS	MB IS	MB SID	MB DISC. & PERIP.	MB PERIP. MOTION CABINET	MB NBCS & SCE
(SPARE)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

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OF POOR QUALITY

# SMS GROUNDS

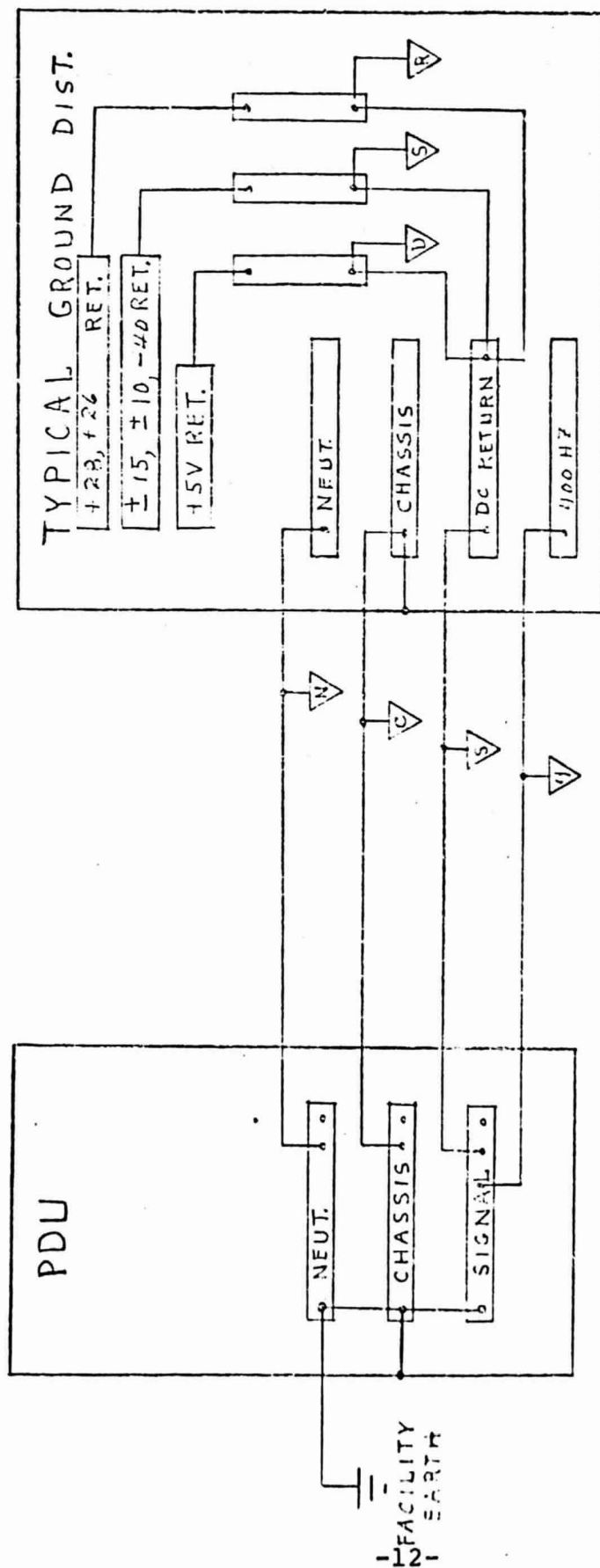


FIG. 4.4.1 ORIGINAL PAGE IS OF POOR QUALITY

(TYPICAL)

FBCS  
EMERGENCY  
SWITCH

MBCS

FB  
PERIPHERAL  
CAB

MB  
PERIPHERAL  
CAB

FB  
OS

MB  
OS

TO  
OTHER  
SWITCHES

TO PDU

TO PDU

TO PDU

TO PDU

TO PDU

FB  
IS

MB  
IS

MOTION  
PLATFORM

PDU  
CONTROL  
PANEL

VISUAL  
SYSTEM

PDU

PDU  
LOGIC CARD

100A  
CB  
TRIP COIL

100A  
CB  
TRIP COIL

100A  
CB  
TRIP COIL

100A  
CB  
TRIP COIL

SMS  
EMERGENCY OFF  
SYSTEM

FIG. 4.5.1

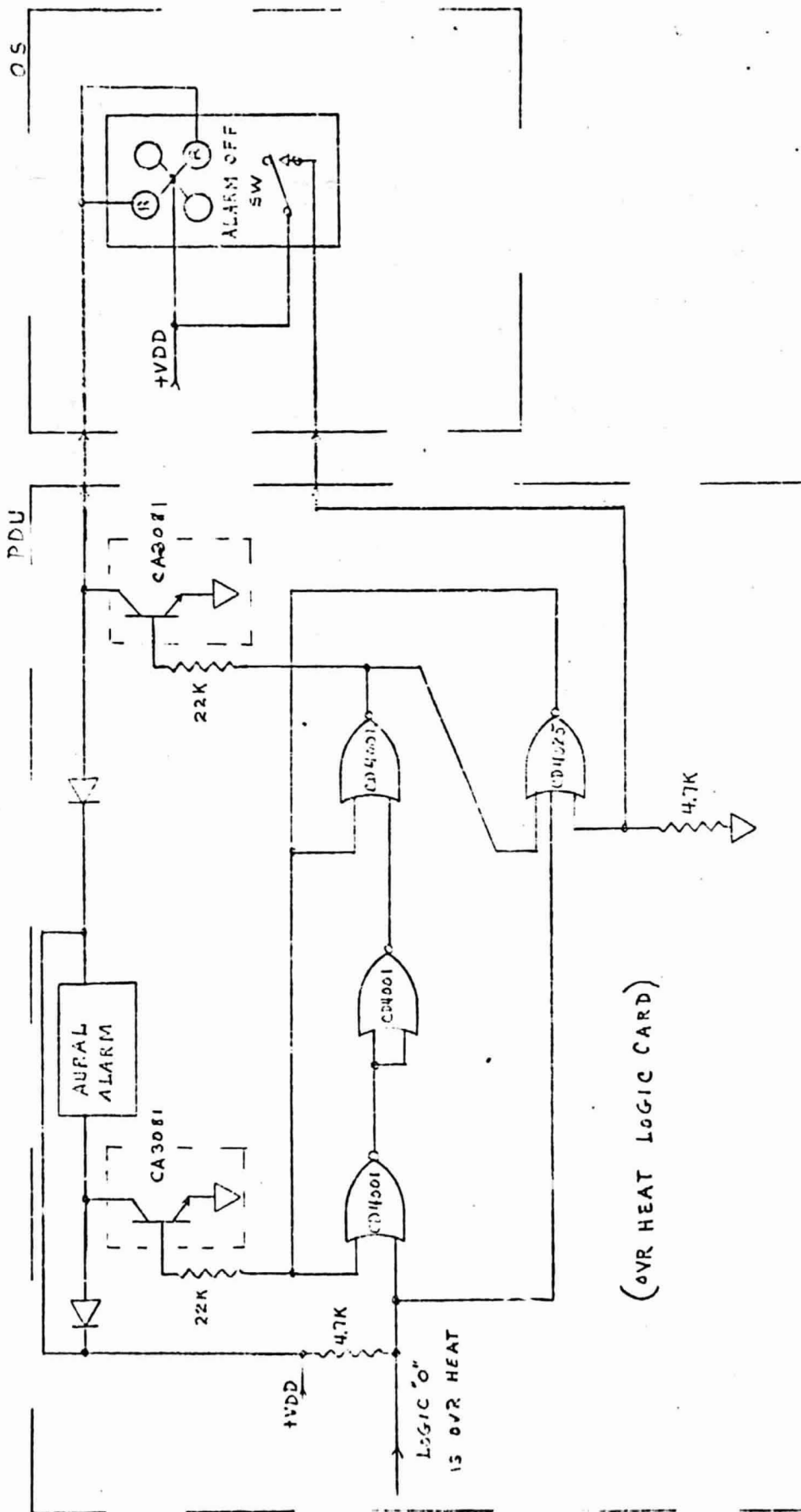
MOTION  
CONTROL  
CABINET  
EMERG.  
SW

HYDRAULIC  
CONTROL  
LOGIC

EMERGENCY  
INTERLOCK

PUMP ROOM  
CONTROL PANEL

EMERG.  
SW



(OVR HEAT LOGIC CARD)

FIG. 46.1.1

REV	DATE	BY	CHKD
1	10/1/70	J. G. H.	J. G. H.
2	10/1/70	J. G. H.	J. G. H.
3	10/1/70	J. G. H.	J. G. H.
4	10/1/70	J. G. H.	J. G. H.
5	10/1/70	J. G. H.	J. G. H.
6	10/1/70	J. G. H.	J. G. H.
7	10/1/70	J. G. H.	J. G. H.
8	10/1/70	J. G. H.	J. G. H.
9	10/1/70	J. G. H.	J. G. H.
10	10/1/70	J. G. H.	J. G. H.

SMS OVR HEAT  
Monitor & Alarm

ORIGINAL DRAWING  
OF FIG. 46.1.1

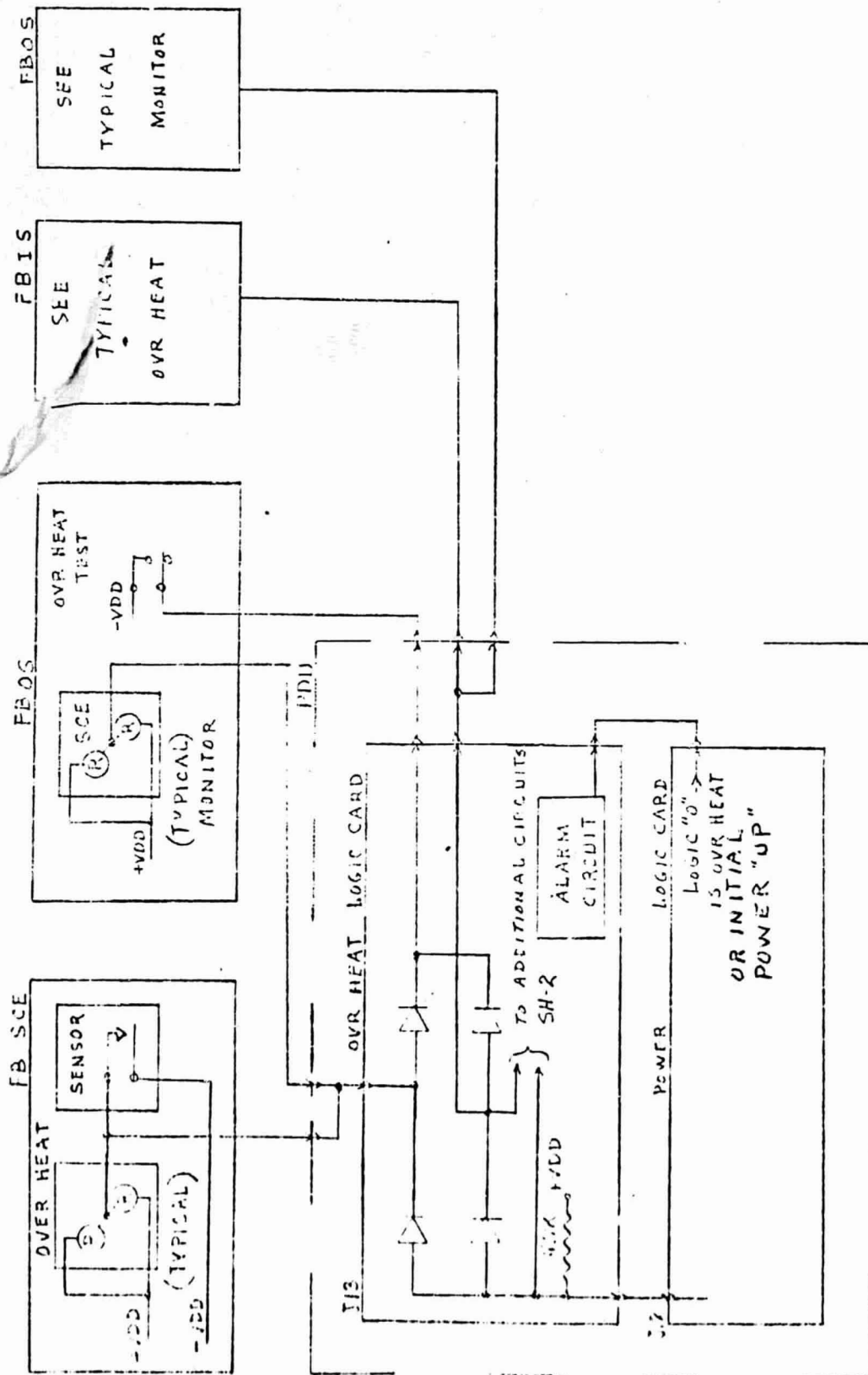


FIG. 4.6.1.2  
ORIGINAL PAGE IS  
OF POOR QUALITY